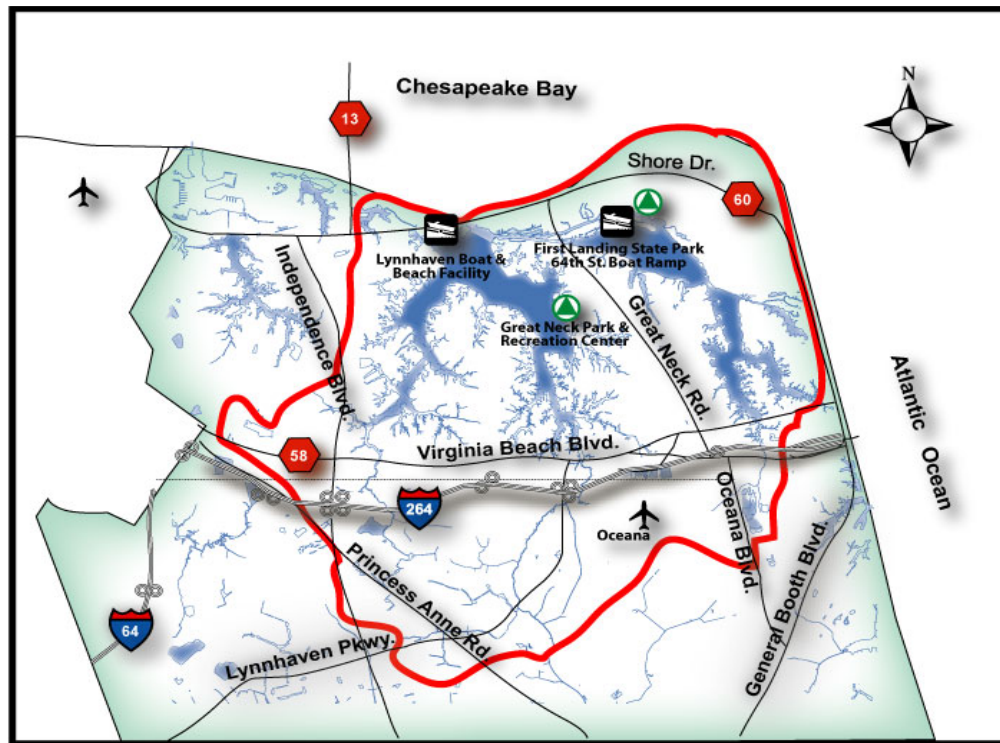


Lynnhaven River NOW presents the
2010 State of the River Report



Our 64 square mile Lynnhaven River watershed, outlined in red on the map above, is home to almost 250,000 Virginia Beach citizens and approximately 40,000 dogs. It is a densely developed, urban/suburban area with all of the water quality issues that are associated with a high percentage of impervious surface and the daily activities of almost a quarter of a million people.

During the past eight years, Lynnhaven River NOW and the citizens of Virginia Beach have made significant progress in the protection and restoration of the Lynnhaven River. We have seen marked increases in the areas open for shellfish harvest, have built and seeded 58 acres of conservation reef and have seen the beginning of the rebound of our oyster population. We have developed a comprehensive community education program along with extensive trainings and programs in our schools to help shape our future decision makers and river stewards.

In 2010, our efforts were recognized in two national publications: the NOAA publication, *Hope for Coastal Habitats*, and the Conservation Fund book, *A Sustainable Chesapeake: Better Models for Conservation*. The

schools that achieved the Pearl School award grew to 30; we launched a new Wetlands Committee and several new educational programs. And we began an exciting strategic planning process.

While two measures, Nitrogen & Phosphorus and Sanitary Sewers, worsened in 2010, Water Clarity, New Funds for Water Quality and Wetlands improved enough to raise our overall average to a B.

Environmental degradation happens over long periods of time; therefore, time is required to reverse that damage. Nevertheless, we cannot be complacent if we want to continue the laudable progress we have made. It is important that we look ahead and continue to consider how to best improve the river's health for future years. We need to increase our efforts to reduce nutrients and bacteria in our water, as well as protect and restore our riparian buffers, wetlands, oyster reef, open space and underwater grasses. Most importantly, we need everyone's participation if we are going to continue the recognized leadership that we have demonstrated in restoring and protecting the Lynnhaven River.

Stormwater run-off is the main vector that brings **POLLUTION** to the Lynnhaven River. During rain events, pollutants are washed from the watershed and carried by rain water into storm drains that dump directly into the river.

Bacteria

C

Bacterial testing is done regularly in the Lynnhaven River by the Virginia Department of Health, Shellfish Sanitation Division. Bacteria levels determine what areas of the river are open to shellfish harvest. Tests indicate that the Lynnhaven River is contaminated with fecal matter from humans, pets and wildlife including birds. In partnership with the City, boaters and dog owners, we have made notable progress in reducing fecal pollution. In 2010, 1781.5 acres of the Lynnhaven, approximately 35% of the river, was open to shellfish harvest. During 2010, we lost some previously open areas in the Inlet and gained new areas in Linkhorn Bay and Broad Bay to reduce the overall open area by 3%.

Dissolved Oxygen

D

Marine animals require dissolved oxygen for survival, like humans require atmospheric oxygen. Crabs, fish and other aquatic animals suffocate without sufficient levels of dissolved oxygen. Dissolved oxygen is produced when underwater plants photosynthesize and it is removed from the water when living organisms breathe and when aquatic bacteria decompose dead algae, plants and animals. Increasing Subaquatic Vegetation and reducing algae growth through nutrient reduction could improve dissolved oxygen levels in the river. In 2010, 7.92 square miles of the Lynnhaven were classified by DEQ as impaired for dissolved oxygen; this is approximately 90% of the river.

Nitrogen & Phosphorus

D

Nitrogen & Phosphorus are the main ingredients in lawn and garden fertilizer. During rain storms, fertilizer is washed off of lawns in the watershed and carried to the Lynnhaven River via storm water. Nitrogen is also air deposited in the river with cars as the primary source in our watershed. Once in the river, excess levels of nitrogen and phosphorus negatively impact water quality because they promote algae growth and algal blooms which reduce water clarity and ultimately remove dissolved oxygen from the water. In 2010, nitrogen and phosphorus concentrations in the Lynnhaven continued to exceed healthy levels, reducing the river's water clarity and dissolved oxygen levels.

Water Clarity

C

Sunlight penetrates deeper into clear water than into murky water. Underwater grasses (SAV) which provide critical water filtration and animal habitat in a healthy aquatic ecosystem, depend on clear water for adequate sunlight penetration. Water clarity is diminished by algae blooms and high concentrations of suspended sediment, soil and sand, that enters the river in stormwater. In 2010, turbidity levels were lower and Lynnhaven water clarity improved moderately, but remains a serious impediment to the growth of underwater grasses (SAV). SAV is a critical element of the river ecosystem and provides habitat, raises dissolved oxygen levels, absorbs nutrients and aids in the settlement of sediments.

Water quality can be improved through **POLLUTION CONTROL** measures that treat or reduce the sources of sediment, nutrients and bacteria before these pollutants reach the river.

Clean Boating

A-

Most boaters value clean water and responsibly dispose of their holding tank contents. However, illicit discharge of sanitary waste by even one recreational vessel releases enough bacteria to contaminate a square mile of water. Since becoming a No Discharge Zone in 2007, the number of gallons of waste pumped out has increased each year from 1000 gallons in 2008 to 1,500 gallons in 2010. Four of our 8 marinas are certified by the state "Clean Marina" program. In 2010, we developed and distributed a new NDZ brochure with our Clean Boater stickers.

Sanitary Sewer

C

To reduce the sources of human waste, containing fecal coliform and enterococci bacteria, polluting the river, the City of Virginia Beach has spent \$56 million, including \$11 million in 2010, reducing the number of sanitary sewer leaks and overflows into the river and eliminating septic tanks within the watershed. In 2010, we have begun tracking the total gallons, in addition to tracking the number of sanitary sewer overflows. Seventeen overflows in 2010 produced 4,451 gallons of contaminated overflow. In 2010, all but 229 of the original 11,600 septic tanks had been eliminated.

New Funds for Water Quality

A+

In 2003, the City Council named the Lynnhaven River one of their highest priorities. Since that time, the City has spent approximately \$49.9 million expanding its stormwater system and increasing public awareness about stormwater pollutants. In 2010 the City allocated another \$2.4 million to support the Lynnhaven No Discharge Zone, begin the development of a Comprehensive Stormwater Management Plan and develop new Bacterial tracking methods to enhance the effectiveness of the Source Identification and Elimination Program.

Stormwater Treatment

D

When it rains, stormwater from most of the watershed flumes into storm drains that dump directly into the Lynnhaven. In 2010, the City upgraded the Lynnhaven Municipal Marina pump-out Facilities, and continues solar aeration to remove bacteria, sediment, and nutrients from stormwater before the pollutants reach the river. In addition the City has completed the first of many Comprehensive Stormwater Management Plans and identified over a million dollars in Water Quality retrofits to be constructed over the next 12 months. Currently, stormwater runoff from only 19% of the watershed is treated, but that percentage will go up as new Green Ribbon strategies are implemented.

Protection and restoration of beneficial natural **HABITAT** is critical for a healthy Lynnhaven River. These natural habitats improve water quality in the river by filtering out pollutants while they provide homes for the river's marine life.

Oysters

The famed Lynnhaven oyster is a keystone species in the river and restoration of our reefs and oyster population is critical to the river's recovery. Oyster reef restoration has been underway since 1997 and we currently have 58 acres of conservation reef; no new reef was built in 2010. Spat set on the existing reefs was strong in 2010 and an additional 798,143 spat were stocked through the school and community oyster gardening programs. In addition, LRNow continued to operate the Save Oyster Shell Program in 2010 with 12 restaurants participating, pick up from community events and 2 public drop off locations.

A-

Open Space & Public Access

The vast majority of the Lynnhaven River's watershed is developed with residences, roads, and buildings. This infrastructure is necessary for humans, but Open Space acreage is also necessary because it contains vegetation that provides natural protection for the river. Though no new Open Space was acquired in our watershed this year, plans are being developed for a Thalia Creek Greenway and the preservation of the Pleasure House Point property. No new access sites were added in 2010.

B-

Wetlands

Wetlands grow at the interface between the river and the land. They protect the river's water quality by intercepting and removing sediment and nutrients from stormwater run-off before it enters the river. Wetlands also provide key habitat for animals, especially juveniles. Wetland areas are destroyed because they grow in desirable areas for shoreline development. Historically, most of the Lynnhaven wetlands have been filled for development increasing the critical nature of protecting the remnants that remain. Less than a ¼ acre (0.1818 acres) of wetland were lost this year through the permitting process. This is an improvement from 2009.

B+

Underwater Grass Beds

We are excited to have gone from 0 to 6.08 acres of underwater grasses (SAV). However, it still constitutes a failing grade. Historically, SAV grew in dense beds in the river. Healthy SAV beds provide critical habitat for crabs, fish and other aquatic animals, while improving water quality by taking up nutrients, stabilizing sediment, and producing dissolved oxygen in the river. Though still at a failing grade, the first new grasses in many years, 6.08 acres in Broad Bay, were detected in 2010. Widgeon grass is currently being tested in several areas of the river as an alternative to Eel Grass that has not thrived due in part to poor water clarity which blocks sunlight from reaching the plants.

F

Lynnhaven River Now is raising environmental **AWARENESS** in the watershed because community education is one of the only strategies for reducing pollution from private residential properties in the Lynnhaven watershed.

Media Attention

Media coverage of the condition of the Lynnhaven River is invaluable for educating the public and generating their interest in helping to address the river's problems. In 2010, we had 24 articles and three television appearances as well as produced and distributed 8 LRNow publications. Additionally, our work was highlighted in a NOAA publication *Hope for Coastal Habitats*, the winter VIMS Bulletin contained an article on our No Discharge Zone designation and LRNow was featured in the Conservation Fund book *A Sustainable Chesapeake: Better Models for Conservation*.

A+

Educational Programs

Community education programs are at the core of our work at LRNow. It is through the efforts of the almost 250,000 citizens of our watershed that we have made significant progress in the past 8 years. During the past year, LRNow held 103 education events and outreach opportunities. In addition to continuing our successful oyster gardening activities, our kayak and bike tours, and our rain barrel programs, we added a new Phragmites Management Program and a full day Citizen Wetlands Workshop that were well received by the community.

A+

Membership & Involvement

LRNow is a rapidly growing organization. Membership and community involvement are critical to our mission. Our system of committees gives many and varied opportunities for citizens to participate in a meaningful way in the development and execution of education and restoration projects in the Lynnhaven watershed. In 2010 our membership grew to 4,758 and 14,664 citizens were involved in LRNow programs and events throughout the year. We greatly appreciate the financial support and river stewardship that our members provide and we encourage all of our members to get involved with the work of LRNow through our outreach events, education programs, volunteer opportunities and committee participation.

A-

School Participation

Through our school programs, we are helping to shape the decision makers and stewards of the future. Teachers and schools reach thousands of students each year and those students, in turn, educate their families about environmental issues. Each year the number of schools achieving the Pearl School status has grown. In 2010, we had 30 Pearl Schools and reached almost 6,000 students through 42 school programs. We also conducted 7 teacher trainings and received the 2010 Model Partnership Award with Cox High School and a Certificate of Recognition from the Community Beautification Program for our Landscape Project at Kemps Landing Magnet School.

A

	Indicator	2010 Grade	2009 Grade	Where we are in 2010	Where we want to be
Pollution	Bacteria	C	C	35% of the river meets the shellfish standard	100% of river meeting the shellfish standards
	Nitrogen & Phosphorus	D	C-	Nitrogen & Phosphorus levels are too high for SAV to thrive	Nitrogen & Phosphorus levels that meet SAV habitat requirements ¹
	Dissolved Oxygen	D	D	7.92 impaired square miles (approximately 90% of river)	0 impaired square miles
	Water Clarity	C	D	Sediment & algae levels are too high for SAV to thrive but some improvement	Sediment & algae levels that meet SAV habitat requirements ¹
Pollution Control	Clean Boating	A-	A-	NDZ in Effect & 4 Certified "Clean Marinas"	NDZ in Effect & 8 Certified "Clean Marinas"
	New Funds for Water Quality	A+	C	\$3.9 Million in 2010	\$3 million per year
	Sanitary Sewer	C	A-	17 sewer overflows & 4,451 gallons spilled ² 229 of 11,600 septs remaining	0 sewer overflows per year & 0 gallons spilled 0 septic tanks remaining of 11,600
	Stormwater Treatment	D	D	19% of total watershed treated with stormwater management	100% of total watershed treated with stormwater management
Habitat	Oysters	A-	A-	798,143 transplanted & 58 total acres of constructed oyster habitat	250,000 per year transplanted & 100 total acres of constructed oyster habitat
	Open Space & Public Access	B-	B-	Open Space: 2,996 acres Public Access: 4 formal sites	Open Space: 4,000 acres Public Access: 15 formal sites
	Wetlands	B+	D	0.1818 acres net loss	0 permitted losses per year
	Underwater Grass Beds	F	F	6.08 acres	175 total acres
Awareness	Media Attention	A+	A+	23 newspaper articles and 3 television appearances	Coverage 18 times per year
	Educational Programs	A+	A+	105 trainings & events 9 new publications	80 per year
	Membership & Involvement	A-	A-	Membership: 4,758 Involvement: 14,664	Membership: 4,000 Involvement: 30,000 (15% of watershed population)
	School Participation	A	A-	Exhibits in all 41 schools Participation from 26 watershed schools; 30 Pearl Schools	Participation from all 41 schools in the watershed

¹Dennison et al (1993) Assessing water quality with submerged aquatic vegetation: Habitat requirements as barometers of Ches Bay Health BioScience 43(2):

²In 2010, we began tracking not only the number of sanitary sewer overflows but also the number of gallons spilled into the river.

