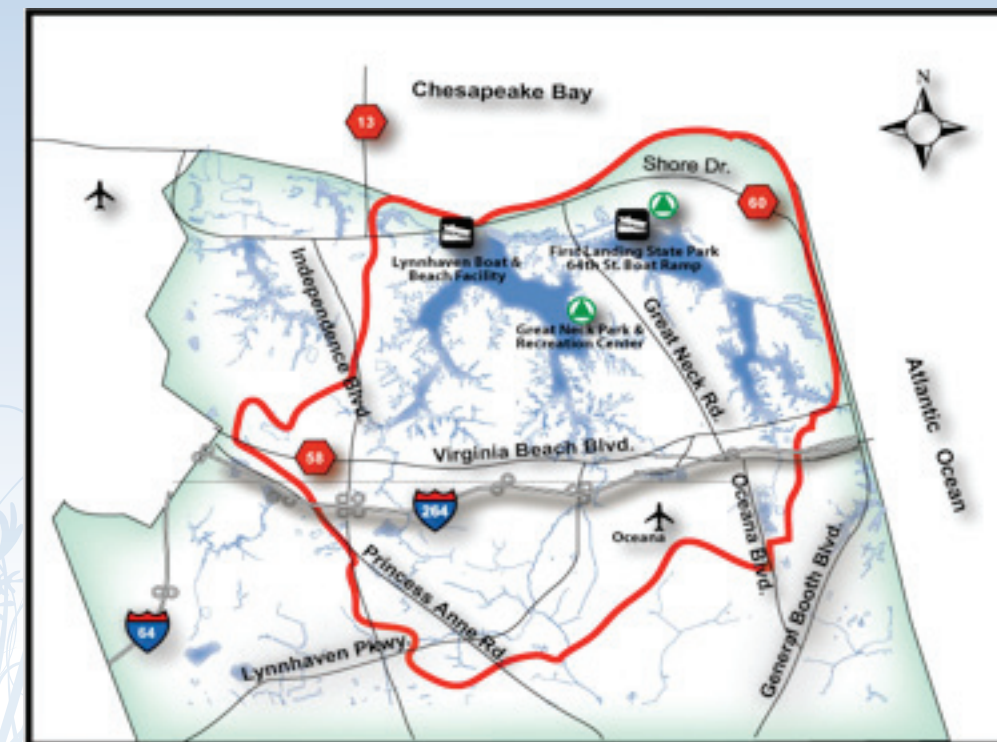


# LYNNHAVEN RIVER NOW PRESENTS THE 2011 State of the River Report



	INDICATOR	2011 GRADE	2010 GRADE	WHERE WE ARE IN 2011	WHERE WE WANT TO BE
<b>POLLUTION</b>	<b>BACTERIA</b>	<b>C+</b>	<b>C</b>	42.6% of the river meets shellfish standard <sup>2</sup>	100% of river meeting the shellfish standards
	<b>NITROGEN &amp; PHOSPHORUS</b>	<b>D</b>	<b>D</b>	Nitrogen & Phosphorus levels are too high for SAV to thrive	Nitrogen & Phosphorus levels that meet SAV habitat requirements <sup>1</sup>
	<b>DISSOLVED OXYGEN</b>	<b>D</b>	<b>D</b>	7.90 impaired square miles (approximately 90% of the river)	0 impaired square miles
	<b>WATER CLARITY</b>	<b>C</b>	<b>C</b>	Sediment & algae levels are too high for SAV to thrive but some gradual improvement noted	Sediment & algae levels that meet SAV habitat requirements <sup>1</sup>
<b>POLLUTION CONTROL</b>	<b>CLEAN BOATING</b>	<b>A-</b>	<b>A-</b>	NDZ in effect & 4 certified marinas 1,438 gallons of sewage pumped	NDZ in Effect & 8 certified "Clean Marinas"
	<b>NEW FUNDS FOR WATER QUALITY</b>	<b>A-</b>	<b>A+</b>	\$2.5 million in 2011	\$3 million per year
	<b>SANITARY SEWER</b>	<b>C+</b>	<b>C</b>	11 sewer overflows & 4,100 gallons spilled 229 of 11,600 septs remain	0 sewer overflows per year & 0 gallons spilled 0 septic tanks remaining of 11,600
	<b>STORMWATER TREATMENT</b>	<b>D</b>	<b>D</b>	19% of the total watershed treated with stormwater management	100% of total watershed treated with stormwater management
<b>HABITAT</b>	<b>OYSTERS</b>	<b>B+</b>	<b>A-</b>	309,800 transplanted & 58 total acres of constructed oyster habitat	250,000 per year transplanted & 100 total acres of constructed oyster habitat
	<b>OPEN SPACE &amp; PUBLIC ACCESS</b>	<b>B-</b>	<b>B-</b>	Open Space: 2,996 acres Public Access: 4 formal sites	Open Space: 4,000 acres Public Access: 15 formal sites
	<b>WETLANDS</b>	<b>B+</b>	<b>B+</b>	0.18 acres net loss	0 permitted losses per year
	<b>UNDERWATER GRASS BEDS</b>	<b>F</b>	<b>F</b>	6.08 acres	175 total acres
<b>AWARENESS</b>	<b>MEDIA ATTENTION</b>	<b>A+</b>	<b>A+</b>	30 media events Book Published First Art Show	Coverage 18 times per year
	<b>EDUCATIONAL PROGRAMS</b>	<b>A+</b>	<b>A+</b>	133 Ed & Outreach Events Pearl Homes: 216 12 new publications	80 per year 100 Pearl Homes 10 new publications
	<b>MEMBERSHIP &amp; INVOLVEMENT</b>	<b>A</b>	<b>A-</b>	Membership: 6,809 Involvement: 18,987	Membership: 5,000 Involvement: 30,000 (15% of watershed population)
	<b>SCHOOL PARTICIPATION</b>	<b>A</b>	<b>A</b>	Participation by 71 schools, 26 in our watershed 45 Pearl Schools	Participation from all 41 schools in the watershed

Every year brings gains and new challenges. One of the areas with the largest gains has consistently been reduction of bacteria. This year is not an exception. The area of the river that meets the rigorous standard for shellfish harvest is now over 42%. In our first State of the River Report in 2005, 1% of the river was open. This improvement has spawned a new commercial oyster industry in the Lynnhaven and is a testament to the progress we can make when all the stakeholders work together.

Another area that has shown consistent improvement is reducing the number of sanitary sewer overflows (SSO's). There were 11 SSO's in 2011 and eight of these occurred during Hurricane Irene. This is a slight decrease from 2010, but a more dramatic decrease from our highest number in 2005 of 115.

One of the highlights of 2011 was the publication of our book, *The Lynnhaven, Restoring a Legend*. By the end of the year, we had distributed 500 copies which are helping to spread the word about the beauty, history and bounty of the Lynnhaven and everyone's role in restoring and protecting the river.

During this past year, we also had our first Lynnhaven Art Show, our first Fall Festival and kicked off our Pearl Home program. Our membership and outreach numbers continue to grow and 45 Virginia Beach schools earned a Pearl School Award, a 50% increase over 2010.

Nevertheless, some areas remain stable but without gains. Increased focus and work will be required to reduce our nutrient and sediment levels, successfully reintroduce SAV to the Lynnhaven and protect and enhance our wetlands and sanctuary oyster reef.

**Our overall grade for 2011 remains a B.**

We are proud of the progress that we have made and dedicated to continuing to work hard, push the limits and make gains in some of the more stubborn areas.

Working with the City of Virginia Beach, the US Army Corps of Engineers and our other partners, plans for additional open space and access sites, oyster reef construction, living shorelines projects and continued education on sustainable practices for homeowners and businesses will continue to produce the results we seek in all areas.

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

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

Stormwater runoff 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+**

Though our grade is still a C+, this is one of the areas where we have made the most dramatic progress. 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. In partnership with the City, boaters and dog owners, we have made notable progress in reducing fecal pollution. In 2005, only 1% of the river met the standard for shellfish harvest. In 2011, 2,047 acres of the Lynnhaven, approximately 42% of the river, is open to shellfish harvest. During 2011 we continued to gain new open areas allowing a commercial oyster industry to grow in the Lynnhaven. This dramatic improvement in bacteria levels is allowing us to enjoy delicious Lynnhaven Oysters again.

**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; nitrogen is also air-deposited in the river with cars as the primary source in our watershed. During rain storms, fertilizer is washed off lawns in the watershed and carried to the Lynnhaven River via stormwater. Once in the river, excess levels of nitrogen and phosphorus negatively impact water quality because they promote algae growth and promote algal blooms which reduce water clarity and ultimately remove dissolved oxygen from the water. In 2010, nitrogen and phosphorus concentrations in the Lynnhaven continue to exceed healthy levels, and reduce the river's water clarity and dissolved oxygen levels.

**WATER CLARITY C**

Sunlight penetrates deeper into clear water than into murky water. Underwater grasses, 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 by high concentrations of suspended sediment, soil and sand that enters the river in stormwater. In 2010, Lynnhaven water clarity improved slightly over 2009, 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-**

In 2011, a new self-service pump out facility open 24 hours per day was installed at the city marina on Long Creek. That brings our total number of pump stations to six for the river. In addition, HRSD offers one free pump out per boat each season. Since becoming a No Discharge Zone in 2007, over 6,500 gallons of boat sewage have been pumped. This total includes 1,438 gallons during 2011. 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.

**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 \$60.2 million expanding its stormwater system and increasing public awareness about stormwater pollutants. In 2011, the City allocated another \$2.5 million to support the Lynnhaven No Discharge Zone, develop new bacterial testing methods to enhance the effectiveness of the Source Identification and Elimination Program and begin the development of the Comprehensive Stormwater Management Plan recommended by the Green Ribbon Committee.

**SANITARY SEWER C+**

The number of sanitary sewer overflows (SSO's) directly impacts bacteria levels in the river. During 2011, the total SSO's was 11, containing 4,100 gallons, and eight of these occurred during Hurricane Irene. This is a slight decrease from 2010. Effective back up power systems for the pump stations is a key element in reducing sanitary sewer overflows and work continues on these upgrades. To reduce the sources of human waste, containing fecal coliform and enterococci bacteria, polluting the river, the City of Virginia Beach has spent \$71.3 million since 2003 on sanitary sewer and pump station expansion and upgrades. This total includes \$15.3 million in 2011.

**STORMWATER TREATMENT D**

When it rains, water runs off our roofs, lawns, driveways and roadways into the pipes that carry the rainwater to 1,100 outfalls that dump the rain water and everything it picks up along the way directly back into the river. In 2011, the City continued to use solar aeration, bacteria and filterra units, dry and wet ponds and other best management practices (BMP's) to remove bacteria, sediment and nutrients from this stormwater before the pollutants reach the river. The amount of the river basin that is treated still remains small but with the advent of practices necessary to meet the Chesapeake Bay TMDL requirements, that should go up significantly. The City is working to get the State and EPA to accept oyster reefs as water quality BMP's.

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 and they provide homes for the river's marine life.

**OYSTERS B+**

The famed Lynnhaven oyster is a keystone species in the river and restoration of our oyster reefs and oyster population is critical to the river's recovery. Oyster restoration work has been underway since 1997 and we currently have 58 acres of sanctuary reef; no new reef was built in 2011. Spat set on the existing reefs was strong in 2011 with the Athey Reef showing the highest numbers. Additionally, 309,800 small oysters were stocked through the school and citizen oyster gardening programs. LRNow continues to operate the Save Our Shell program and collected approximately 1,200 bushels of shells from restaurants, events and the public in 2011. Plans are underway for construction of 20 new acres of sanctuary reef and construction of a spat on shell facility in our watershed. In addition, the City's Chesapeake Bay TMDL Implementation Plan prioritizes oyster reef construction.

**WETLANDS B+**

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 runoff before it enters the river. Wetlands also provide key habitat for animals, especially juveniles. Our goal is 0 permitted wetland losses each year. During the past year, less than 1/4 acre (0.18 acres) of wetland were lost to development. Living Shorelines are an important way to protect and enhance shoreline wetlands. LRNow has begun to identify sites for several model living shorelines projects and will work with homeowners interested in building a living shoreline on their property.

**OPEN SPACE & PUBLIC ACCESS B-**

Most of the Lynnhaven's watershed is developed with residences, roads and buildings; 38% of our land area is covered with impervious surface. This infrastructure is necessary for humans, but Open Space acreage is also necessary because it contains vegetation that provides natural protection for the river, habitat for wildlife, and recreational value for humans. No new open space or river access points in the Lynnhaven watershed were added in 2011. Several new projects are in the planning stages: Thalia Creek Greenway, Thalia Creek canoe/kayak launch, the Lynnhaven Strategic Growth Area, and continuing work to acquire the Pleasure House Point property.

**UNDERWATER GRASS BEDS F**

Historically, submerged aquatic vegetation (SAV) grew in dense beds in the Lynnhaven. 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. In 2010, 6.08 acres of underwater grasses were discovered in Broad Bay indicating that a viable seed bed still exists. No new beds were detected in 2011. Widgeon grass is being tested in several areas of the river as an alternative to Eel Grass that has not thrived primarily because of water clarity but in part because of gradually increasing water temperatures. Reestablishment of SAV beds is essential to reintroduction of the Bay Scallop into the Lynnhaven.

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 A+**

One of the highlights of 2011 was the release of our book, *The Lynnhaven, Restoring a Legend*, in April, 2011. It has been well received and we had distributed almost 500 copies by the end of the year. In addition, we had 30 media events during this past year. Media coverage of the condition of the Lynnhaven River is invaluable for educating the public and generating interest in helping to address the river's problems. We ran our public service advertisements for three months with Cox Communications in fall 2011 and held the first Lynnhaven River Art Show and our first Fall Festival.

**EDUCATIONAL PROGRAMS A+**

Community education is at the core of our work at LRNow. It is through the efforts of the 240,000 citizens of our watershed that we have made significant progress in the past eight years. During the past year, we launched our Pearl Home program with exciting enthusiasm from our community. From the launch on November 1 to the end of the year, we had enrolled over 200 Pearl Homes. LRNow staff and volunteers conducted 133 educational programs during the year and produced 12 new publications including our Pearl Home brochure and a new Wetlands publication.

**MEMBERSHIP & INVOLVEMENT A**

LRNow has grown rapidly since our founding in 2002. We are entering our 10th year with more than 6,000 members and volunteers. Members are vital to our work for many reasons. The community support that we have experienced is the major reason for our successes. Together we really can make a difference. Through a wide range of educational, outreach and volunteer events and activities during the year, 18,771 people were involved with LRNow.

**SCHOOL PARTICIPATION A**

If you believe like we do that the children are the future stewards of the river, we have reason to be optimistic. During the past year, 45 schools in Virginia Beach qualified for a Pearl School Award; this is a 50% increase from 2010. Seventy-one schools participated in LRNow programs including 26 in our watershed. Lynnhaven River Watershed signs are in every school in our watershed and more than 150 teachers participated in 12 teacher trainings last year alone.