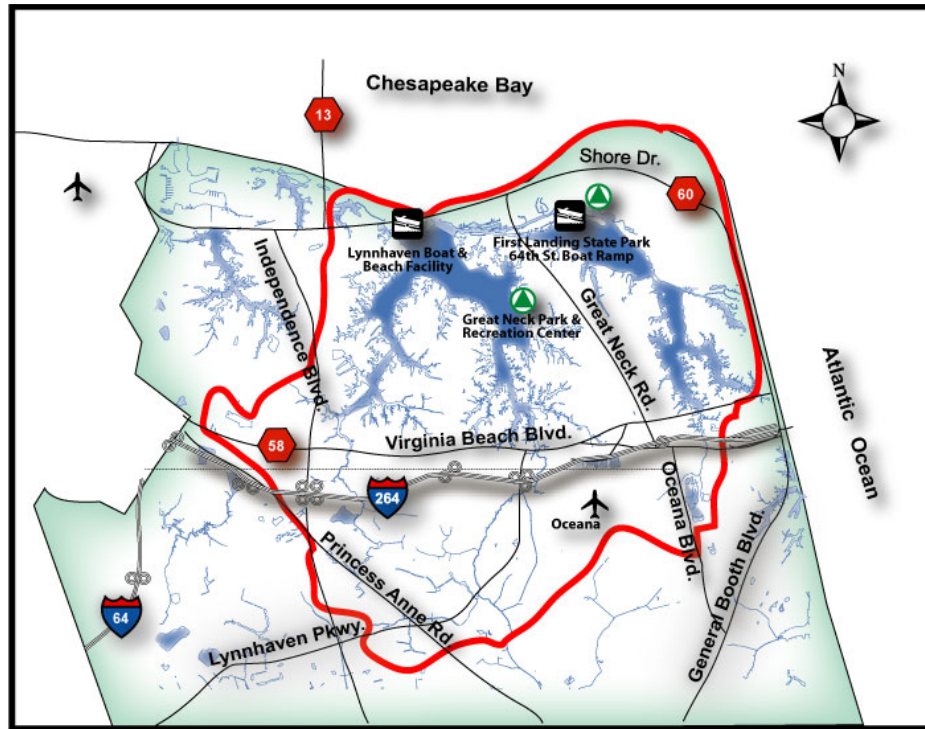


Lynnhaven River NOW presents the  
**2007 State of the River Report**



Lynnhaven River NOW is creating an environment and laying groundwork to improve water quality in the Lynnhaven. We engage citizens and students in oyster and watershed restoration, we train landscapers and lawn care providers to protect water quality via “green” property care, we raise community awareness and advocate on the river’s behalf, we support the Green Ribbon Committee’s recommendations, and we work with the City and several partners to promote further improvements in the watershed and the river.

In 2007, we have resounding evidence that the steps we are undertaking to restore water quality in the Lynnhaven River are working. Of greatest note, **almost one-third of the river currently meets the stringent water quality requirements that allow safe shell fish consumption. We haven’t seen bacterial concentrations this low since the 1930’s.** What has changed in 2007 to bring about this improvement? The three main factors are: (1) the Lynnhaven River is now a **“No Discharge Zone,”** (2) the City has reduced the number of septic systems in the watershed to 3% of what we once had, and (3) citizens are diligently picking up after their pets.

**In 2007, the Lynnhaven River receives a B.**

For the third year in a row, our State of the River grade has improved, from a B- in 2006 to a B in 2007. The Lynnhaven’s water quality improvement this year is truly the success of community synergy... with a little bit of help from the environment. This year was a drought year. With less rain, there was less stormwater runoff, thus fewer pollutants were carried from the watershed to the river by rain water. The drought doesn’t negate the success we as a community have affected. We have had droughts since the 1930’s and never seen water quality improve to the extent we have seen this year. However, we must continue to be vigilant in our efforts to protect and restore the watershed, because 2008 may be a wet year with more stormwater reaching the Lynnhaven and we want that stormwater to be as clean as possible.

The Lynnhaven River’s watershed (outlined in red above) is primarily residential. Thus, citizen participation in pollution reduction and river restoration are absolutely vital in perpetuating our exciting progress. Thank you for being a part of the effort.

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 tests indicate that water in the Lynnhaven River is contaminated by fecal matter from humans, pets and wildlife. This fecal contamination has the potential to cause serious illness and disease, especially when people consume shellfish that filter water containing high levels of bacteria. We have been working in partnership with the City and with boaters and dog owners, to reduce fecal pollution and improve river water quality. In 2007, 1462 acres of the river (29%) meet the stringent water quality standards that support safe shellfish consumption. This is a great improvement from 365 acres (7%) open last year.

### **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. In 2007, 7.9 mi<sup>2</sup> (approximately 90%) of the Lynnhaven is classified as impaired for dissolved oxygen.

### **Nitrogen & Phosphorus**

**C+**

Nitrogen & phosphorus are the main nutrients in lawn and garden fertilizer because they promote plant growth. During rain storms, fertilizer is washed off of lawns in the watershed and carried to the Lynnhaven River via storm water. Once in the river, excess levels of nitrogen and phosphorus negatively impact water quality because they fertilize tremendous algae blooms, which reduce water clarity and ultimately remove dissolved oxygen from the water. In 2007, several sections of the Lynnhaven River contain nitrogen and phosphorus concentrations that exceed healthy levels<sup>1</sup>.

### **Water Clarity**

**D**

Water clarity is diminished by algae blooms and by high concentrations of suspended sediment, or dirt, that enters the river in stormwater. Sunlight penetrates deeper into clear water than into cloudy water. Underwater grasses, which provide critical water filtration and animal habitat in a healthy aquatic ecosystem, depend on clear water for adequate sunlight penetration. Currently, water clarity in the Lynnhaven is impaired by high levels of algae and suspended sediment that prevent seagrass from thriving<sup>1</sup>.

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**

**B+**

Most boaters value clean water and responsibly dispose of their holding tanks. However, illicit discharge of sanitary waste by even one recreational vessel may release enough bacteria to contaminate an entire square mile of water. In 2007, the Lynnhaven River became Virginia's first estuarine "No Discharge Zone." This designation completely eliminates vessel discharge as a source of bacterial and nutrient pollution to the river. Also in 2007, two Lynnhaven marinas are certified "Clean Marinas."

### **Sanitary Sewer**

**B**

Fecal coliform and enterococci bacteria in the river provide a reliable indication of human fecal contamination in the Lynnhaven. To reduce the sources of human waste, the City of Virginia Beach is working to reduce the number of sanitary sewer leaks and overflows into the river, and they have aggressively pursued the elimination of septic tanks within the watershed. In 2007, only 321 septic tanks remain in the watershed.

### **New Funds for Water Quality**

**B**

In 2004, the City Council named the Lynnhaven River one of their highest priorities. This designation has been extremely beneficial for water quality in the river. In 2007, the City allocated \$2 million to "retrofit" some of the 800+ untreated stormwater outfalls in the watershed with stormwater management devices that intercept and reduce pollutants before they enter the river. In addition, the City has set aside funds in their Capital Improvements budget that are earmarked for future projects in the Lynnhaven.

### **Stormwater Treatment**

**D**

When it rains, stormwater from most of the watershed flumes into stormdrains that dump directly into the Lynnhaven. Stormwater can be treated to remove bacteria, sediment, nutrients, and trash before the stormwater carries the pollutants into the river. Currently, stormwater run-off from only 17% of the watershed is treated. In 2007, the Green Ribbon Committee developed recommendations to reduce future pollution inputs from stormwater run-off.

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 because (1) oysters filter sediment and algae from tremendous volumes of water, and (2) oyster reefs provide critical habitat and food for animals in the river. Oyster reef restoration has been underway since 1997 to revitalize our oyster population, which had declined by 99% since 1607. In 2007, the Army Corps of Engineers created 30 new acres of oyster habitat and the community stocked thousands of oysters into the Lynnhaven.

### Open Space

**B-**

Ninety percent of the Lynnhaven River's watershed is developed with residences, roads, and buildings. This infrastructure is necessary for humans, but undeveloped Open Space acreage cannot be completely compromised because it contains vegetation that provides natural protection for the river. In 2000, the City authored an Open Space plan that prioritizes the preservation and protection of 100 new acres of undeveloped land in the watershed. In 2007, 2.5 new acres were preserved.

### 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 run-off before it enters the river. Wetlands also provide key habitat for animals, especially juveniles. Wetland areas have been destroyed in the past because they grow in desirable areas for shoreline development. Currently, there is a "no net loss" policy in place to protect wetlands from further destruction.

### Underwater Grass Beds

**F**

Historically, underwater grass, or Submerged Aquatic Vegetation (SAV), grew in dense beds in the river. Healthy SAV beds provide critical habitat for crabs, fish and other aquatic animals, and SAV beds improve water quality by taking up nutrients, stabilizing sediment, and producing dissolved oxygen in the river. SAV acreage has declined drastically in recent years, to a mere remnant of historical levels, due to poor water clarity which blocks sunlight from reaching the plants.

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+**

Radio, newspaper and television media reach a very large and diverse audience. Media coverage about the condition of the Lynnhaven River is an invaluable vehicle for educating the public and generating their interest in helping to address the river's problems. In 2007, we have had 19 newspaper articles focusing on Lynnhaven River water quality and oyster restoration, and we have run 2 television ads about pet waste and fertilizer. In addition, we published a Rain Garden Guide and our 2008 Calendar.

### Educational Programs

**A+**

Lynnhaven River NOW is working with several partners to execute a comprehensive community education program that supports our mission of improving water quality in the river. Our programs are designed to increase the community's awareness and stimulate involvement in restoring the Lynnhaven River. In 2007, we trained 58 landscapers in "Lynnhaven-Friendly Landscaping," we held clean-ups at our Adopt-a-Waterway, and we trained homeowners to install water-friendly Rain Gardens.

### Membership & Involvement

**A-**

Lynnhaven River NOW is a rapidly growing organization. We greatly appreciate the financial support and river stewardship that our members provide. We encourage members to take advantage of our educational programs, special events, volunteer opportunities, and our quarterly newsletter and publications which bring important news about the Lynnhaven River right to their doorsteps. In 2007, we increased our goal for this indicator and now aspire to obtain membership and involvement from 10% of the watershed population, up from 5% last year.

### School Participation

**B+**

Teachers and schools reach thousands of students in our watershed each year, and students in turn educate their families about environmental issues. Over the summer, Lynnhaven River NOW partnered with the City to provide 4 summer teacher training courses focusing on oyster restoration, watershed awareness and rain garden construction. In 2007, we also launched a new school program, "Restoring Wetlands in the Classroom," and we recognized our first 7 schools as our "Pearl Schools" in honor of their river education and stewardship.

	Indicator	2007 Grade	2006 Grade	Where we are in 2007	Where we want to be
<b>Pollution</b>	<b>Bacteria</b>	<b>C</b>	D	29% of river meeting the shellfish standards	100% of river meeting the shellfish standards
	<b>Nitrogen &amp; Phosphorus</b>	<b>C+</b>	C	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>	D	7.9 impaired square miles (approximately 90%)	0 impaired square miles
	<b>Water Clarity</b>	<b>D</b>	F	Sediment & algae levels are too high for SAV to thrive	Sediment & algae levels that meet SAV habitat requirements <sup>1</sup>
<b>Pollution Control</b>	<b>Clean Boating</b>	<b>B+</b>	B	NDZ in Effect & 2 Certified "Clean Marinas"	NDZ in Effect & 8 Certified "Clean Marinas"
	<b>New Funds for Water Quality</b>	<b>B</b>	B	\$2 million for retrofits	\$3 million per year for retrofits
	<b>Sanitary Sewer</b>	<b>B</b>	B-	58 sewer overflows & 321 septic tanks remaining of 11,600	0 sewer overflows per year & 0 septic tanks remaining of 11,600
	<b>Stormwater Treatment</b>	<b>D<sup>2</sup></b>	B-	17% of total watershed treated with stormwater facilities	100% of total watershed treated with stormwater facilities
<b>Habitat</b>	<b>Oysters</b>	<b>B+</b>	C+	308,000 spat transplanted & 35.5 total acres of constructed oyster habitat	250,000 per year transplanted & 100 total acres of constructed oyster habitat
	<b>Open Space</b>	<b>B-</b>	B	2.5 new acres preserved (total of 51.3 acres since 2000)	100 new acres preserved
	<b>Wetlands</b>	<b>B</b>	C	¼-acre of permitted loss	0 permitted losses per year
	<b>Underwater Grass Beds</b>	<b>F</b>	D	2 total acres	175 total acres
<b>Awareness</b>	<b>Media Attention</b>	<b>A+</b>	A+	19 newspaper articles & 2 TV advertisements	Coverage 12 times per year
	<b>Educational Programs</b>	<b>A+</b>	A+	52	20 per year
	<b>Membership &amp; Involvement</b>	<b>A<sup>-2</sup></b>	A+	15,807	20,000 (10% of watershed population)
	<b>School Participation</b>	<b>B+</b>	B+	Exhibits in all 41 schools Participation from 18 schools	Participation from all 41 schools in the watershed

<sup>1</sup> Dennison et al. (1993). Assessing water quality with submerged aquatic vegetation: Habitat requirements as barometers of Chesapeake Bay Health. *BioScience* 43(2): 86-94.

<sup>2</sup> Although our numbers have gone up from 2006 to 2007, our letter grade appears to have decreased because we have made our goal more rigorous for these two indicators.