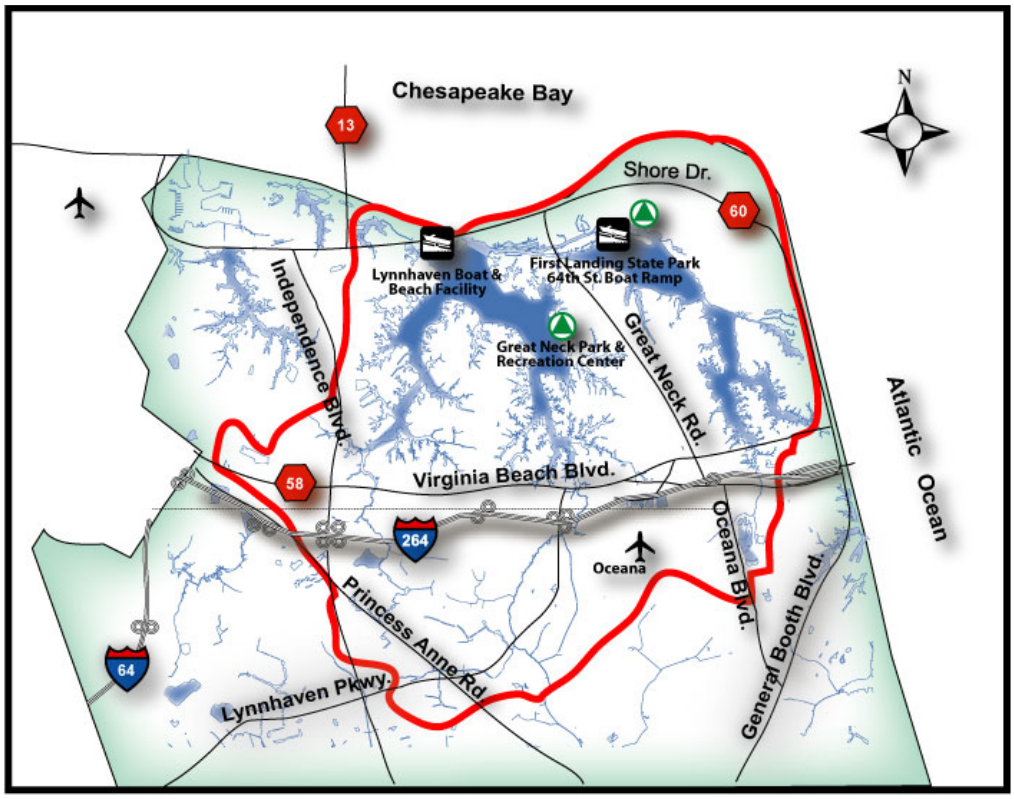
Lynnhaven River 2007 presents the

2006 State of the River Report



The Lynnhaven River has a highly developed watershed (outlined in red above), covering 64 square miles of the City of Virginia Beach. Watershed development is largely residential with approximately 200,000 people, roughly one-half of Virginia Beach's population, living in one-fifth of the city's total land area. Water quality in the Lynnhaven River is currently degraded due to high levels of pollutants entering the river and decreased acreage of beneficial habitats that filter pollutants from the water.

Lynnhaven River 2007 was founded in 2003 with the mission to substantially improve water quality in the Lynnhaven River. Why is *2007* in our name? Because we wanted to see a marked water quality improvement by 2007, and we would measure progress through increases in the portion of the river where shellfish could be safely consumed. As you will see in this State of the River Report, we have made progress. Water quality is improving: 7% of the river now meets shellfish standards, up from 1% last year. This success is truly the result of community synergy.

We have made progress.

Our State of the River grade has also improved, from C last year to B- this year. Increased public awareness and involvement is largely to credit for the improved grade. Between our efforts here at Lynnhaven River 2007 and those of our volunteers, our partners, our donors, and the City of Virginia Beach, we have reached a staggering number of people through the media and education programs. This elevated community awareness lays the groundwork for increased environmental stewardship and community participation in pollution reduction and river restoration in the future.

The Lynnhaven River receives a B-.

A B- is better than before but we have a long challenge ahead. Restoring the Lynnhaven's water quality is a tremendous undertaking that could not be *completed* by 2007, but we have created an impressive beginning. We can perpetuate our exciting progress with your participation. Henceforth, we will work to restore the river *now,* as **Lynnhaven River Now**.

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.

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 2006, a substantial portion of the Lynnhaven (7.9 mi^2) was classified as impaired for dissolved oxygen.

Bacteria — D

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 dog owners to reduce fecal pollution and improve river water quality. In 2006, we saw 315 new acres of the river that now meet the stringent water quality standards that support safe shellfish consumption. This is a great improvement over last year.

Nitrogen & Phosphorus — C

Nitrogen & phosphorus are the main nutrients in lawn and garden fertilizer because they promote plant growth. Rain transports excess fertilizer from properties in the watershed to the Lynnhaven River. Excess nutrient levels negatively impact water quality because they fertilize tremendous algae blooms, which reduce water clarity and ultimately remove dissolved oxygen from the water. In 2006, several sections of the Lynnhaven River contained nitrogen and phosphorus concentrations that exceed healthy levels[1].

Water Clarity — F

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, which prevent underwater grasses from thriving[1].

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. Two marinas in the Lynnhaven are now certified "Clean Marinas" that provide vessel pump out facilities and education in "Clean Boating." River water will be further protected from vessel discharge in the near future, when the "No Discharge Zone" designation is approved.

Stormwater Treatment — B-

When it rains, stormwater from most of the watershed flumes into stormdrains that dump into the Lynnhaven. This stormwater can be treated to remove sediment, nutrients, trash and bacteria, before the stormwater is released into the river. Currently, stormwater runoff from 17% of the watershed is treated. The City's newly formed Green Ribbon Committee is now making recommendations that will reduce and improve runoff in the future.

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 2006, the City allocated $2.05 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.

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. City officials estimate that only 125 septic tanks will remain in the watershed by 2010.

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.

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. Since then, 62 acres have been preserved.

Oysters — C+

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 construction is the premier strategy for revitalizing the devastated oyster population, which has declined by 99% since 1607. In 2006, several partners, including thousands of citizens and students, stocked oysters onto the sanctuary reefs, where they will spawn and produce more oysters.

Wetlands — C

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 — D

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 that blocks sunlight from reaching the plants.

Lynnhaven River 2007 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 2006, we have had 20 newspaper articles on Lynnhaven River water quality and oyster restoration; we have run 2 television ads about pet waste and fertilizer; and we have had air time on NPR. We have also distributed our educational documentary about the river to schools, television and interested members.

Educational Programs — A+

Lynnhaven River 2007 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 2006, we held displays and workshops on Lynnhaven-Friendly Landscaping and Oyster Restoration, we ran several clean-ups at our new Adopt-a-Waterway, and we held our Public Lecture Series that included our inaugural Science Symposium.

Membership & Involvement — A+

Lynnhaven River 2007 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 2006, we surpassed our goal and obtained membership and involvement from over 7% of the watershed population.

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 2007 partnered with the City to provide 4 summer teacher training courses focusing on oyster restoration, watershed awareness and rain garden construction. In 2006, we also launched our new school recognition program, "Pearl Schools," to honor and encourage river education and stewardship.

	Indicator	2006 Grade	2005 Grade	Where we are in 2006	Where we want to be
Pollution	Dissolved Oxygen	D	B	7.9 impaired square miles	0 impaired square miles
	Nitrogen & Phosphorus	C	C	Nitrogen & Phosphorus levels are too high to support SAV survival	Nitrogen and Phosphorus levels that meet SAV habitat requirements[1]
	Bacteria	D	F	7% of river meeting the shellfish standards	100% of river meeting the shellfish standards
	Water Clarity	F	F	Total Suspended Solid (TSS) levels are too high to support SAV survival	TSS levels which meet SAV habitat requirements[1]
Pollution Control	Clean Boating	B	B	2 Certified "Clean Marinas" & NDZ nearing approval	8 Certified "Clean Marinas" & NDZ Approved
	New Funds for Water Quality	B	B	$2.05 million for retrofits	$3 million per year for retrofits
	Stormwater Treatment	B-	B-	17% of total watershed treated with stormwater facilities	30% of total watershed treated with stormwater facilities
	Sanitary Sewer	B-	C+	85 sewer overflows & 474 septic tanks remaining of 11,600	0 sewer overflows per year & 0 septic tanks remaining of 11,600
Habitat	Open Space	B	B-	11.7 new acres preserved (total of 62 acres since 2000)	100 new acres preserved
	Oysters	C+	C+	937,000 spat transplanted & 5.5 total acres of constructed oyster habitat	250,000 per year transplanted & 100 total acres of constructed oyster habitat
	Wetlands	C	C	½ acre of permitted loss	0 permitted losses per year
	Underwater Grass Beds	D	F	20 total acres	175 total acres
Awareness	Media Attention	A+	A+	20 newspaper articles & 2 TV advertisements	Coverage 12 times per year
	Educational Programs	A+	A	47	20 per year
	Membership & Involvement	A+	B-	14,817	10,000 (5% of watershed population)
	School Participation	B+	C	Exhibits in all 41 schools Participation from 20 schools	Participation from all 41 schools in the watershed

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