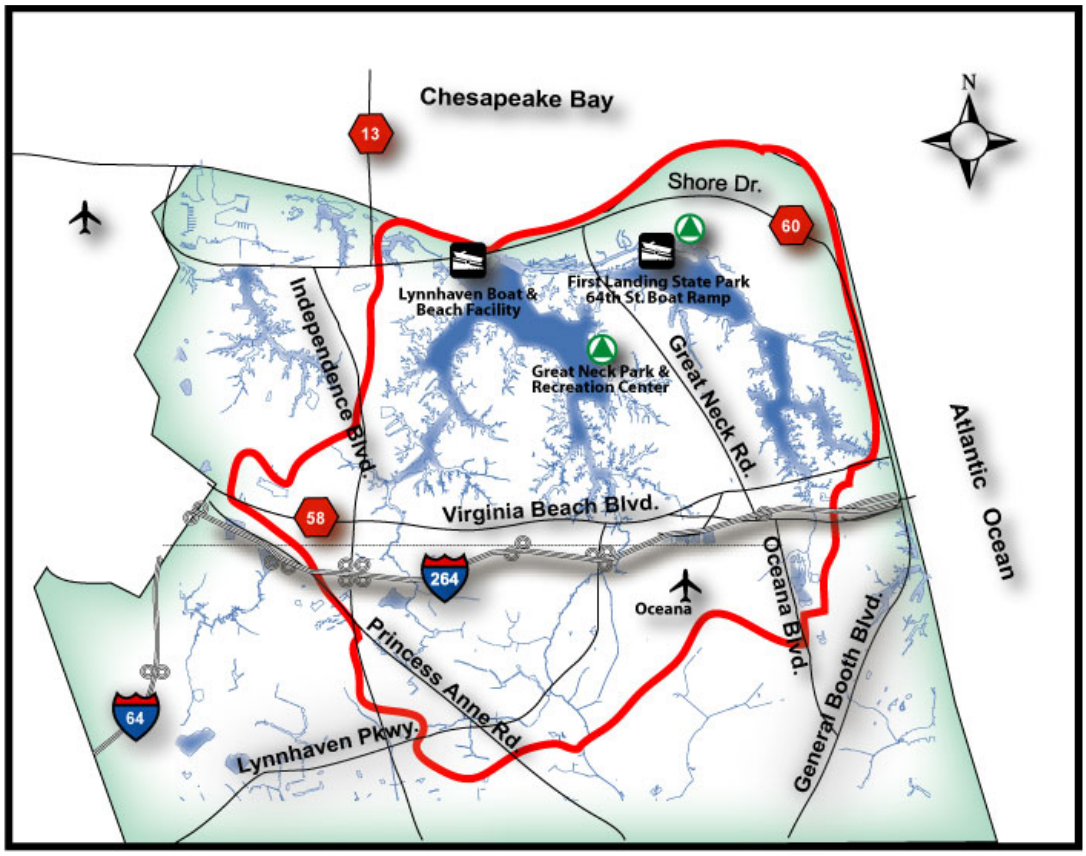
Lynnhaven River 2007 presents the

2005 State of the River Report



The Lynnhaven River has a highly developed watershed (outlined in red above), covering 67 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. To reach this goal, we are working (1) to identify and reduce sources of nutrients, sediment, bacteria and chemicals running off of lawns, parking lots, roadways and out of septic systems in the Lynnhaven watershed; and (2) to restore vital habitats such as oyster reefs, salt marshes, and riparian buffers that filter polluted runoff and improve water quality for the river and its marine life.

This year, Lynnhaven River 2007 has developed our first "State of the River" Report to capture the status of water quality in the river. Currently, the Lynnhaven River receives a C. This is not as high as we would all like, but we are in the early stages of restoring the river and increased capital improvements and community awareness do not improve water quality over night. Henceforth, we will produce an annual "State of the River" report that will allow us and our members to track changes in the condition of the Lynnhaven over time.

The Lynnhaven River receives a C.

The Lynnhaven River has long been legendary for its world famous oysters and its rich history. It is our intent to make the Lynnhaven River equally as legendary as an example to other watersheds around the Chesapeake for this community's involvement in restoring the water quality and vitality of the legendary 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.

Dissolved Oxygen — B

Marine animals require dissolved oxygen for survival, like humans require atmospheric oxygen. Crabs, fish and other aquatic animals will literally 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 2005, 4.2 river miles were considered "impaired" due to low levels of dissolved oxygen.

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 2005, Lynnhaven river water contained nitrogen and phosphorus concentrations that exceed healthy levels[1].

Bacteria — F

Bacterial tests indicate that water in the Lynnhaven River is contaminated by fecal matter from humans, pets and wildlife. Pet owners can greatly reduce the fecal waste in stormwater by picking up after their pets. Fecal contamination has the potential to cause serious illness and disease, especially when people consume shellfish that filter water containing high levels of bacteria. Lynnhaven River 2007 is working to restore water quality to a level where shellfish can safely be consumed. Today, only 1% of the river is safe for shellfish consumption.

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" practices. River water will be further protected from vessel discharge after the river is designated a "No Discharge Zone."

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 2005, 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 — B-

Stormwater can be treated to remove sediment, nutrients, trash, and in some cases, fecal bacteria before it enters the Lynnhaven River. Currently, 17% of the watershed is served by water quality facilities such as stormwater retention lakes, ponds, and other types of water quality treatment systems. This means that the stormwater from over 80% of the watershed flumes directly through storm drains and is untreated when it enters the river.

Sanitary Sewer — C+

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 provides natural protection for the Lynnhaven River. The City has authored an Open Space plan that prioritizes the preservation and protection of 100 new acres of undeveloped land in the Lynnhaven watershed that contain vegetation that protects the river.

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. Sanctuary reef construction is the premier strategy for revitalizing the devastated oyster population, which has declined by 99% since 1607. Last year, thousands of citizens and students raised oysters and stocked them onto sanctuary reefs where they will spawn and produce more oysters for the river.

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 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 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 2005, the Virginian-Pilot and Beacon have published 12 articles on Lynnhaven River water quality, oyster restoration, and no discharge zone designation, to name a few. Additionally, a new video about the Lynnhaven River is now available for distribution to schools and television broadcast.

Educational Programs A

This year, Lynnhaven River 2007 received grant funds to launch a new, comprehensive community education program to support our mission of improving water quality in the river. Our educational programs increase the community's awareness and involvement in restoring the Lynnhaven River. Education opportunities in 2005 included workshops on Lynnhaven-Friendly Landscaping, Water Quality Monitoring and Oyster Restoration, plus we offer an evening Public Lecture Series to increase knowledge and curiosity about the Lynnhaven.

Membership & Involvement B-

Lynnhaven River 2007 is a young and 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 which brings important news about the Lynnhaven River right to their doorstep. Ultimately, we aspire to obtain membership and involvement from 5% of the watershed population.

School Participation C

Our community education program has one component that focuses on instructing teachers about the Lynnhaven's watershed, water quality and environmental restoration. Teachers and schools reach thousands of students, and students in turn educate their families. Last summer, Lynnhaven River 2007 partnered with the City to provide a summer teacher training course on watershed awareness, and two courses to train schools to do oyster restoration.

	Indicator	Grade	Where we are in 2005	Where we want to be
Pollution	Dissolved Oxygen	B	4.2 impaired river miles	0 impaired river miles
	Nitrogen & Phosphorus	C	N & P levels exceed SAV habitat requirements	N < 20.8µg/L and P < 140µg/L to meet SAV requirements[1]
	Bacteria	F	1% of river safe for shellfish consumption	100% of river safe for shellfish consumption
	Water Clarity	F	Total Suspended Solid (TSS) level exceeds SAV habitat requirement	TSS below 15 mg/L to meet SAV requirements[1]
Pollution Control	Clean Boating	B	2 Certified "Clean Marinas" & NDZ in Application Phase	8 Certified "Clean Marinas" & NDZ Approved
	New Funds for Water Quality	B	$2 million for retrofits	$3 million per year for retrofits
	Stormwater Treatment	B-	17% of total watershed treated with stormwater facilities	30% of total watershed treated with stormwater facilities
	Sanitary Sewer	C+	115 sewer overflows & 542 septic tanks remaining of 11,600	0 sewer overflows per year & 0 septic tanks remaining of 11,600
Habitat	Open Space	B-	50 new acres preserved	100 new acres preserved
	Oysters	C+	705,000 spat transplanted & 5.5 total acres of constructed oyster habitat	250,000 per year transplanted & 100 total acres of constructed oyster habitat
	Wetlands	C	½ acre of permitted loss	0 permitted losses per year
	Underwater Grass Beds	F	6 total acres	175 total acres
Awareness	Media Attention	A+	12 newspaper articles	Coverage 12 times per year
	Educational Programs	A	16	20 per year
	Membership & Involvement	B-	1,650	10,000 (5% of watershed)
	School Participation	C	15	All 41 in 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.