

The Inland Bays Estuary of Delaware, a Fragile Beauty



The Inland Bays of Delaware: Rehoboth, Indian River and Little Assawoman are shallow, slow draining bodies of water bounded on the east by beach areas with resultant fast growing urban development. They are bounded on the west by slow draining tributaries which are challenged by both development and agriculture. The ecology of the estuary is rapidly changing to one that is more urban.

The estuary is home to many residents and vacationers who enjoy the many opportunities for retirement, raising their families and enjoying the recreational opportunities. The University of Delaware estimates the Estuary contributes around \$2B to Delaware's economy annually according to the Center for the Inland Bays 2012 Annual Report.

Many enjoy the opportunities to fish, crab, water and Jet Ski, swim and other water based activities. *Recent documentation indicates more fishing trips occur in the Inland Bays than do in the Atlantic Ocean and Delaware Bay.* Recent additions of new golf courses: Salt Ponds, Bay wood Greens, Plantation Lakes, Bear Trap, Rehoboth Country Club, and the Peninsula attract residents and vacationers alike. Many seek retirement and second homes here to take advantage of these opportunities.

The waters of our Bays attract birding enthusiasts for we are on the Atlantic flyway and experience a wide variety of bird life in marshes, wetlands and sanctuaries. Fishermen have formed rod and reel clubs, as well as fly

fishing clubs to take advantage of these opportunities. Crabbing and clamming is a popular sport for many in the area.

Unfortunately our Estuary is being challenged by high levels of pollution which have destroyed the eel grass beds and oyster and scallop beds which were so prevalent here at one time. To tell you more about these challenges the Foundation Science Coordinator has prepared the following over view for your reading:

When too many nutrients, mainly nitrogen and phosphorus, are added to bodies of water, it can act like fertilizer, causing excessive growth of algae leading to more serious problems such as low levels of oxygen dissolved in the water. Because there are increasingly more people living in coastal areas, there are more nutrients entering our coastal waters from wastewater treatment facilities, runoff from land in urban areas during rains, and from farming.

The Department of Natural Resources and Environmental Control (DNREC) has listed more than 90% of Delaware's rivers, streams, and lakes as "impaired."¹ "Impaired waters" are polluted waters. More technically, they are waters that do not meet water quality standards for their designated uses, such as recreation, fishing, or drinking. The DNREC has found that 85% of Delaware's rivers and streams do not fully support swimming use and 94% do not fully support the fish and wildlife use. Most of these waters do not meet the standards because of nonpoint source pollution impacts.²

Approximately 86% of Delaware's rivers and streams, 44% of ponds and lakes, and 2 % of estuarine waters (not including the Delaware River and Bay) were found to have bacteria concentrations above the levels considered acceptable for primary contact recreation (swimming, full body immersion, and water skiing). Many of Delaware's estuarine and tidal waters exhibited bacteria levels above those considered safe for the harvesting and consumption of shellfish. Waters most impacted include the

¹Nonpoint Program Annual Report Delaware 2011; DNREC at 7
http://www.epa.gov/reg3wapd/pdf/pdf_nps/nps_annualreports/2011/DE%202011%20NPS%20AR.pdf

² Final 2012 integrated 305(b) Report and 303(d) List, DNREC, April 2013 at 3.

tidal tributaries of the Delaware Bay and portions of Delaware's Inland Bays.³

Left unaddressed, nonpoint source problems, such as urban and agricultural runoff, erosion, and sedimentation have led to poor habitat conditions for fish and other aquatic life, decreased enjoyment of our surface waters for recreation, and presented unhealthy conditions for those surface waters and ground waters upon which we rely for drinking water and other domestic uses. To date, reduction of nonpoint sources of pollution in Delaware has been achieved through the incorporation or installation of specific best management practices (BMPs) addressing agriculture, septic systems, and storm water management.

The reductions needed to restore Delaware's waterways have been modeled and promulgated into Delaware's Administrative Code (Title 7:7000-7400) as Total Daily Maximum Loads (TMDLs) that need to be achieved. However, no time frame by which the reductions needed was mandated. The TMDLs were set for Rehoboth and Indian River Bays in 1998 and for Little Assawoman Bay in 2005. While point sources of pollution have been largely removed, **we have a long way to go to achieve the nutrient reductions needed to clean up the tributaries to the Inland Bays.**

The table below shows the reductions the TMDL regulation called for. 2010 was a near average flow year and TMDLs are the loads allowed under such average flow conditions. There has been some improvement, but the results for many streams are either little changed, or have become further degraded.

Stream	TN TMDL Reduction Needed	2010	Trend	TP TMDL Reduction Needed	2010	Trend
Lewis-	40%	85%	Degraded	40%	-	TMDL

³ *Id.* at 10-11.

Rehoboth Canal						Met
Love Creek	65%	50%	Improving	40%	-	TMDL Met
Herring Creek	65%	75.1%	Degraded	40%	84.9%	Degraded
Guinea Creek	65%	51.5%	Improving	40%	-	TMDL Met
Lingo Creek	65%	NC	Degraded	40%	NC	Improving
Swan Creek	85%	86.4%	About same	65%	43%	Improving
Millsboro Pond	85%	81.7%	About same	65%	68.4%	About same
Iron Branch	85%	79.4%	Improving	65%	79.2%	Degraded
Pepper Creek	85%	81.6%	About same	65%	77.7%	Degraded
Vines Creek	85%	87.6%	About same	65%	9.0%	Improving
Blackwater Creek	65%	36.8%	Improving	40%	76.1%	Degraded
White Creek	65%	40.8%	Improving	40%	77.1%	Degraded
Collins Creek	65%	-	TMDL Met	40%	-	TMDL Met
Miller Creek	40%	15.9%	Improving	40%	40.4%	About same
Dirickson Creek	40%	51.9%	Degraded	40%	-	TMDL Met