

## Introduction

# Chatham's Waters

When we think of Cape Cod, we think of water. Water dominates our landscape and our history. The region's landscape was shaped by multiple glacial ice ages. Humankind's history on the Cape traces back through the Monomoyics and Wampanoag Tribes to over 10,000 years ago.

Archaeological evidence of shoreline campsites, extensive shell mounds and water-centered legends attest to the central importance of water in the lives of the Cape's first inhabitants. Early settlers from Europe built their villages around harbors or along freshwater streams that provided water for livestock, shallow wells, and dams that harnessed the water's energy for mills. Like the Native Americans, they depended heavily on fish and shellfish harvested from the freshwater ponds, estuaries and the ocean. In later years, marine commerce, fishing, boat building, and whaling became the Cape's economic mainstays.

Chatham has 66 miles of coastline, one of the longest in the Commonwealth. Perhaps the single most obvious and widely cherished feature of our waterways is their beauty. Our many embayments, tidal rivers, marshes, freshwater ponds, and beaches all have their own character and natural beauty.

## Embayments

Embayments consist of harbors connected to the Atlantic Ocean and Nantucket Sound and tidal estuaries (see map on page 4). Estuaries are places where fresh and salt waters meet and mix and are some of the most productive ecosystems on earth. With beaches, marshes and eelgrass beds, an estuary provides critical spawning, nursery and feeding areas for countless species of birds, shellfish, and finfish that are commercially important to us all. Oysters, clams, quahogs, bay scallops and crabs spend their entire lives in estuaries. Crabs, worms, eels and other invertebrates provide vital food sources for the larger fish and birds living and/or feeding in the estuary. The largest salt marshes in Chatham are found along the Nantucket Sound shoreline, located behind the barrier beaches of Stage Harbor, Harding's Beach, and Cockle Cove Beach. Marine and freshwater wetlands serve many critical environmental functions. They act as pollution filters, buffers against storm damage and flooding, and provide habitat for many spawning and juvenile species. Approximately two-thirds of the landed value of commercial catch on the East Coast of the United States comes from species that live at least part of their life cycles in estuaries.

### **Bassing Harbor System:**

The system consists of Bassing Harbor, Crows Pond, Ryders Cove and Frost Fish Creek, all sub-embayments to Pleasant Bay. Bassing Harbor is the outermost basin in this system and exchanges waters with Pleasant Bay. The Harbor is a relatively stable, high habitat quality system, with good eelgrass beds. Crows Pond, an inland sub-embayment, is a deep pond with eelgrass beds around the periphery. Ryders Cove is the innermost sub-embayment of the system. The full basin appears to have supported eelgrass beds in the past, many of which do not exist today. Ryders Cove is the entrance to Chatham's only remaining active herring run leading to Stillwater Pond and Lovers Lake. Frost Fish Creek is a tributary system to Ryders Cove that is primarily a salt marsh with a central basin. Frost Fish Creek has undergone significant changes resulting from past cranberry bog activities and construction of Route 28.

### **Muddy Creek:**

Muddy Creek exchanges tidal waters with Pleasant Bay and extends from Pleasant Bay to Route 137 and Old Queen Anne Road. During the late 1800's and into the 1900's, it was divided into an upper and a lower portion by a dike whose weir was removed or washed away. Similar to Frost Fish Creek, the ecology of Muddy Creek was altered by the construction of Route 28. Anecdotal evidence suggests that Muddy Creek did support a herring run into Minister's Pond and Mill Pond.

## Stage Harbor



Photo by Geri Appleyard

### **Stage Harbor System:**

Stage Harbor is a multi-use harbor with emphasis on recreational boating, commercial fishing and shellfishing. There are two tidal rivers that lead off the harbor, Oyster River, which connects the harbor to Oyster Pond, and Mitchell River, which connects the harbor to Mill Pond and Little Mill Pond. The System contains some of the most heavily used harbor infrastructure in the Town. The contrast between the busy multi-use harbor and the estuarine ponds and associated habitats contributes to the character, vibrancy and significance of the area. Commercial and recreational harvesting of bay scallops, quahogs, soft-shell clams, and mussels occurs throughout the system. Oysters, once abundant throughout the system are harvested sporadically and are a recreational resource since they are off limits to commercial harvesting

## Pleasant Bay



Photo by Geri Appleyard

### **Pleasant Bay:**

Pleasant Bay is widely recognized as one of the richest and most diverse eco-systems in the northeast region. The Bay is separated from the Atlantic Ocean by a barrier beach, which is the most prominent physical feature in determining the health of the estuary. The barrier beach protects the Bay from the harsh impact of ocean waves, while the inlets control the ebb and flow of ocean waters. Presently, there are two inlets that allow tidal waters to flow in and out of the Bay, one formed in 1987 and the other in 2007. The Bay's size and diversity support abundant resources for shellfishing, finfishing, scenic viewing, swimming and boating. The watershed of the Pleasant Bay estuary is rich in wetlands resources that are vital to the area's ecology, its natural beauty, and its commercial and recreational values. Shellfishing and finfishing are important commercial and recreational activities in Pleasant Bay. Quahogs, scallops, mussels and soft shell crabs are historically the most popular shellfish for commercial and recreational fishing. The Chatham Harbor subembayment is a critical off-loading location for Chatham's commercial fishing fleet.



Cockle Cove

Photo by Geri Appleyard

### **Sulphur Springs System:**

The system consists of Cockle Cove Creek, Bucks Creek and Sulphur Springs. Cockle Cove is a salt marsh with a central tidal creek which drains almost completely at low tide. Sulfur Springs is a shallow embayment at the head of Bucks Creek that is transitioning to a salt marsh. Eelgrass has not been observed for over a decade in Bucks Creek. The entire system is undergoing ecological change resulting from the constant physical change at the mouth of Bucks Creek.



Bucks Creek

Photo by Geri Appleyard

### **Taylor's Pond:**

Taylor's Pond is a drowned kettle pond connected to Nantucket Sound by a tidal salt marsh, Mill Creek. There is currently no eelgrass in the Pond. This system is also undergoing change due to the physical changes occurring in the mouth of Mill Creek at Nantucket Sound.

## Freshwater Ponds

There are over 25 freshwater ponds in Chatham, most of which are windows on our aquifer because they have formed where low areas in the ground surface expose the water table. In size, they range from the tiny 1.2-acre Pinkwink Pond to the largest 41-acre White Pond and Goose Pond (known as “kettlehole ponds”), with a total acreage of over 260 acres. Seven of our ponds are Great Ponds, defined by the state as ponds over 10 acres in size, and owned by the State of Massachusetts in the public trust. These include Emery, Goose, Lovers Lake, Mill, Schoolhouse, Stillwater and White Ponds. Some of the Great Ponds, such as Goose, Schoolhouse, Stillwater, Lovers Lake and White Pond, have public access (some unimproved), and are open to the public for fishing, kayaking, swimming. The smaller ponds, mostly private, have limited public access/use.

Due to the extremely sandy soils found in Chatham, we also have a globally rare type of pond known as coastal plain pond. Found only in southeastern Massachusetts, these ponds are characterized by widely fluctuating water levels, resulting in extreme variations in the width of the pond shore from year to year. They are host to many rare and endangered plant and animal species, including damselflies, dragonflies and turtles.

Chatham’s many ponds provide for various types of recreation such as swimming, fishing, boating, ice-fishing and bird watching. They also serve as habitat for many species of fish and waterfowl and their shores provide habitat to many plant and animal species. These waters and shoreline provide a place of scenic beauty and solitude for Chatham citizens.

Lovers Lake



Photo by Geri Appleyard

Pond	Area (Acres)	Public Access	Activities
Mill Pond	24	Unimproved	Fishing
Goose Pond	41	Fisherman Landing	Fishing
Schoolhouse	23	Town Beach	Swimming, Fishing, Kayak/canoe
Lovers Lake	38	Unimproved	Kayak/canoe, Fishing
Stillwater Pond	19	Unimproved	Kayak/canoe, Fishing
Emery Pond	14	No	Kayak/canoe
White Pond	41	Landing	Swimming, Kayak/canoe, Fishing

*Cape Cod Pond and Lake Atlas, Cape Cod Commission, 2003*

# Protecting Our Waters

## Together we can make a difference!

**T**oday the well-being of our town is still intimately linked to the health of our waters. We are never far from estuaries, ponds and beaches. Many residents fish local waters for sustenance. Seasonal residents and tourists flock to the Cape to bask and hike on its beaches, swim in its waters, catch and eat local fish and shellfish, and go boating on its sparkling bays. All these activities require clean water and a healthy marine ecosystem. We share our waters with a vast array of aquatic plants and animals. We depend on them to maintain the ecological balance that keeps our paradise intact. They need our help to survive.

During the past several decades, Cape people have noticed that the water quality of salt ponds, harbors, and shorelines has been deteriorating. The water grows greener and murkier in the summer months. Slime algae proliferate on rocks and dock ladders; the numbers of valued fish and shellfish are declining. Studies by local scientists and shellfish wardens confirm that areas in some estuaries lack enough oxygen to sustain life.

Many of our current water quality problems result from land use practices, rapid local development and population growth. Every additional septic system and newly fertilized lawn further pollute the waters. Each house may seem unimportant by itself, but multiply the impact of a single household by thousands of households and it becomes clear why our irreplaceable water resources are deteriorating before our eyes.

**The good news is that it's not too late to save our waters – if each of us plays our part.**

We all want to protect our water resources, but often we do not know what we can do. *Chatham Blue Pages* will give you some ideas. It begins with the big picture – providing everything you need to know about the Cape's water cycles – and then identifying actions that each of us can take to safeguard our region's waters. Many of the solutions are simple; some will even save you money. Join us to protect the health of our waters.

**Please keep this booklet near your phone book as a handy reference.** Share it with members of your household, or lend it to a neighbor or friend. If you are a landlord, give your tenants a copy; most likely they will also want to know what they can do to protect our waters.

### Monomoyicks and Champlain

The Chatham area was originally occupied by the Monomoyick branch of the Wampanoag tribe and was called Monomoit. Samuel de Champlain was the first known European explorer to anchor in Stage Harbor, in 1606. He described Chatham as an area “where there is much cleared land and many little hills” where the natives planted corn. He said of the Native Americans that they were “not so much hunters as fisherman and tillers of the soil.” Stage Harbor was full of oysters, other shellfish and many fish. Champlain explored a good part of Chatham and drew an excellent map and description of the area. Although relations with the Native Americans started out well, hostilities soon broke out over a stolen axe. Six Frenchmen and an unknown number of natives were killed. Incidents like this and others made the Cape natives hostile to Europeans for some years, until the founding of the Plymouth Colony in 1620. Governor Bradford, with the help of Squanto, made a lasting peace with the Native Americans on Cape Cod in 1630.



## From Glaciers to Kettle Ponds

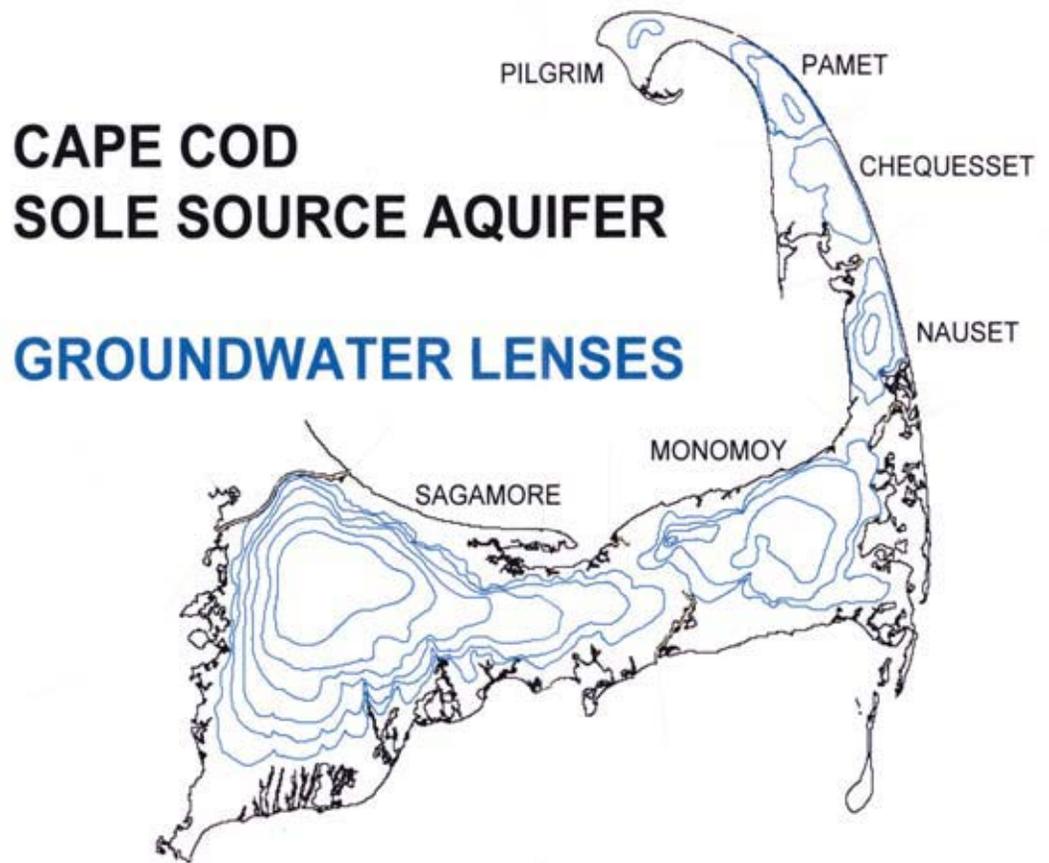
Some 10,000 years ago, as the last glacier receded from this, its southernmost reach, the Cape was formed by the deposit of sand and debris over an ancient clay base. Colder, denser blocks of ice remained embedded in the substrate, and when these finally melted, the terrain collapsed, producing hollows. These then filled with groundwater, forming the freshwater ponds and lakes of Chatham. Later, as the sea rose, forming what are now Pleasant Bay and Chatham's South Coast embayments, some of these ponds – Crows Pond, Ryders Cove, Oyster Pond and Mill Pond are examples – became connected to the ocean and Nantucket Sound.

## Cape Cod Aquifers

All of our drinking water, whether from municipal water supplies or from private wells, comes from the rain and snow that falls on Cape Cod and soaks into the sandy soils left by the glacier. The entire layer of groundwater beneath the Cape is referred to as the Cape Cod Sole Source Aquifer and is made up of six separate freshwater lenses. Lenses can be thought of as mounds of groundwater bordered by marine water at the edges, bedrock on the bottom, and separated from each other by tidal rivers or inlets that cut across the Cape peninsula. Groundwater is the subsurface water located beneath the water table, in soils and geologic formations that are fully saturated.

The drinking water for Chatham and adjacent towns to the north and west is drawn from one large aquifer that lies beneath these towns. This large aquifer is called the Monomoy Lens. This

lens is approximately 300 feet thick, deeper than the height of the Provincetown Monument, and is the sole source of drinking water for over 40,000 homes and businesses in six towns. More than five million gallons are pumped out each day in the off-season. When our population triples in the summer, so does the water consumption. The soil types and geologic deposits are relatively continuous and allow water to move through them at a speed averaging one foot per day. Flow from the middle of the Monomoy Lens to the shore – a distance of more than 3.5 miles – takes over 18,000 days, or nearly 50 years. Contaminants that are introduced into the lens and degrade water quality can ruin our drinking water for more than a generation.



*In 1982, the Environmental Protection Agency designated the Cape's water supply as a "Sole Source Aquifer." This designation recognizes that the Cape's groundwater is our only source of drinking water.*



*About 40% of the annual rainfall seeps into the ground to replenish our aquifer.*