

Water Resources

Overview

Ogunquit has significant water resources and protecting them is a top priority and concern for the Town. Water quality issues stemming from non-point sources have plagued the freshwater, estuarine, and marine water systems within and around Ogunquit. The most prominent waterbody in the town, aside from the Atlantic, is the Ogunquit River, a 9.8-mile-long (15.8 km) tidal river that originates in South Berwick, travels east and southeast through York and Ogunquit, and ends at the Atlantic Ocean in Ogunquit. The Josias River is another prominent waterbody in Ogunquit, flowing from neighboring York into Ogunquit and emptying into the Gulf of Maine at Perkins Cove. The main stem of the Josias River is 5.75 miles long.

There are no mapped Great Ponds within Ogunquit, but there is considerable riparian habitat along wetland complexes within the town and along the Josias and Ogunquit Rivers and their tributaries.

Watersheds and Rivers

Ogunquit River and Watershed

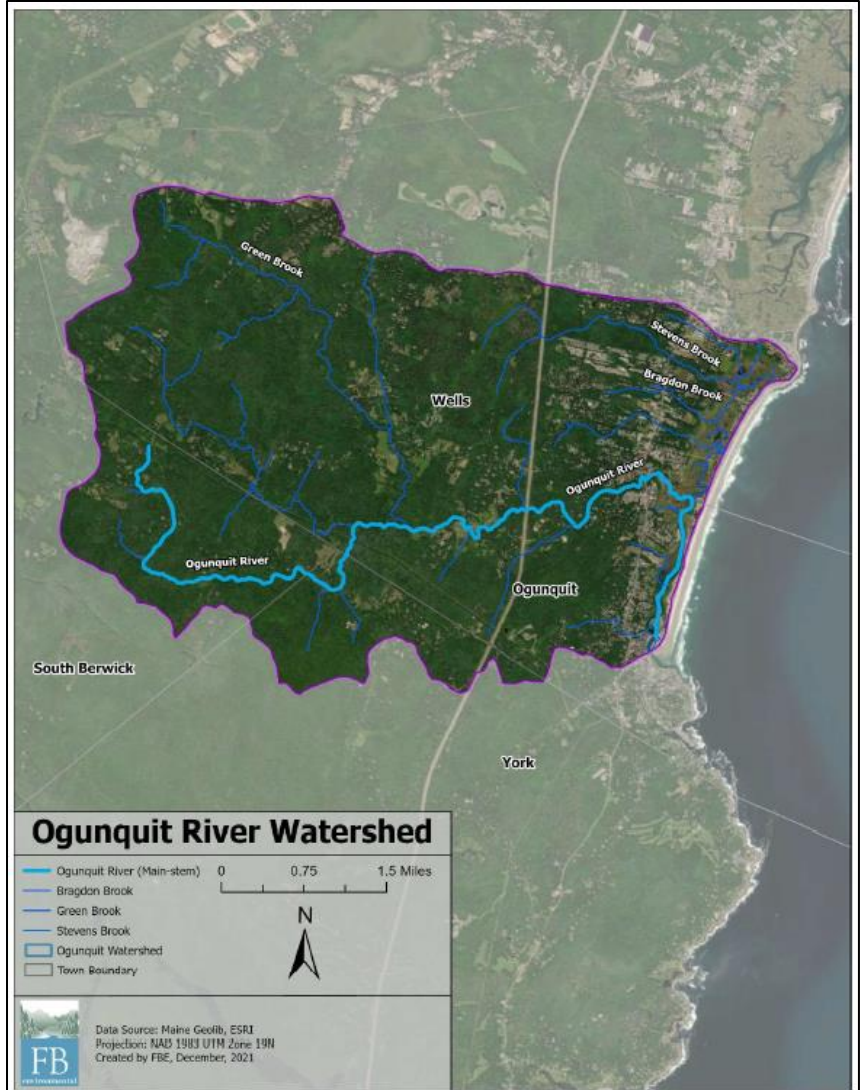
The Ogunquit River begins with the joining of two small streams just south of Bennett Lot Road in the woodlands surrounding Mount Agamenticus in South Berwick. Traveling east, it crosses under Old County Road in South Berwick, continuing to flow through forested lands and an occasional field. A mile further it is joined by two brooks draining the Third Hill area of York and then turns north passing under the Ogunquit Road. It then converges with Tatnic Brook, before flowing east and meeting up with Green Brook; both brooks are major tributaries draining the largely forested Tatnic Hills in the Town of Wells. Continuing east, the river encounters an increasingly developed landscape as it crosses under North Village Road, then Captain Thomas Road, and under the Maine Turnpike/Interstate-95 toward Route 1, all in Ogunquit. Shortly after passing under Route 1, the river cascades as a waterfall to the head of tide and an expanse of a salt marsh and estuary. Water flow is then amplified by the tides, Stevens Brook, and the salt marshes to the north before bending south for a mile behind Ogunquit's barrier beach. Leavitt Stream, a small tributary, enters the river near its mouth, just upstream of the Beach Street bridge. The river widens considerably then meets the rocky bluff of Israel Head, taking a sharp turn and emptying into the Gulf of Maine at an outlet on the south end of Ogunquit Beach.

The Ogunquit River and its tributaries combine to form the Ogunquit River Watershed (*Map 1*). The watershed covers an area of approximately 13,300 acres, or 21 square miles, and spans portions of the towns of Wells, Ogunquit, South Berwick, and York. Approximately 17% of the watershed is within the Town of Ogunquit. The outer boundary of the Watershed starts in the Tatnic Hills in Wells and South Berwick and continues south to Third Hill in York at an elevation of approximately 250 feet above sea level. The Maine Turnpike/Interstate-95 runs north-south through the Watershed, with the majority of development, including dense pockets of businesses and residences located along the Route 1 corridor, which is east of the Turnpike.

To the west, the Watershed land consists primarily of large blocks of undeveloped land and scattered residential properties. All water (precipitation, septic, and irrigation) within the area either evaporates, is absorbed by plants, or eventually migrates into the river and flows to the Gulf of Maine. Due to the relatively small size of the drainage area and predominantly shallow soils over bedrock, river flow rates decrease in dry periods and have even ceased during summer droughts.

There are no remaining man-made dams or flow restrictions on the Ogunquit River. A few active farms remain and at least one has used the river as a source of irrigation water. The Ogunquit River Watershed provides for recreation opportunities, scenic views, and wildlife. It includes a 2-mile barrier beach which, together with the river, serves as the primary attraction for thousands of seasonal visitors and supports a vigorous and increasingly year-round economic base in Ogunquit and the southern Maine region. The salt marsh estuary formed by the river is located within the Rachel Carson National Wildlife Refuge and serves as habitat for significant wildlife habitat.

Since 1923, a mile-long stretch of barrier beach and sand dunes extending from the mouth of the Ogunquit River north to Wells has been protected from development and has been maintained by the Town of Ogunquit. The stretch of Ogunquit River that flows along the inland side of the barrier beach is heavily used for activities such as boating, swimming, bird watching, and fishing by more than one million residents and visitors each year. In addition to these forms of recreation, the Ogunquit River Estuary is open to clamming, capable of providing approximately 25,000 pounds of soft-shell clams annually.



Map 1 Ogunquit River Watershed. (Source: 2021 Water Quality Monitoring Report, FB Environmental Associates)

Josias River and Watershed

Ogunquit's other major river, the Josias River, begins in neighboring York and flows east through Ogunquit, emptying into the Gulf of Maine at Perkins Cove. The main stem of the Josias River is 5.75 miles long and drops 220 feet into the Cove.

The Josias River Watershed drains in portions of York and Ogunquit. In addition to the main stem of the River, the Watershed also includes numerous small ponds and wetlands, which provide valuable habitat for rare plants and endangered and threatened wildlife. Although the majority of the Watershed is undeveloped forestland, with scattered agricultural land and small parcels of private conservation land located throughout, there exists areas of development along Route 1 and near the coast that has the potential to degrade water quality as growth continues.

Water Quality Monitoring and Management

Activities and land use within Ogunquit's watersheds significantly impact the health and water quality of Ogunquit's rivers and shores. Unfortunately, high bacteria level counts in Ogunquit's waterways have resulted in multiple beach advisories by Maine Healthy Beaches.

The Ogunquit River estuary is listed as impaired by the Maine Department of Environmental Protection (DEP) due to the presence of elevated fecal indicator bacteria (Enterococci) levels, as shown by regular water sampling. The Ogunquit River is also listed on the Maine DEP Nonpoint Source Priority Watersheds List of Impaired Marine Waters and Threatened Streams. Water quality sampling efforts, described in more detail below, have found a number of instances of bacterial contamination in and along the Ogunquit River. Riverside Beach is especially vulnerable to any pollutants washing downstream via Ogunquit River. A 2021 water quality monitoring report by FB Environmental Associates (FBE) notes that the cause of Ogunquit's waterbody impairments is largely attributed to local nonpoint source pollution, mainly in the form of stormwater runoff.

Ogunquit does not treat stormwater; all runoff goes directly to water bodies. There are approximately 40 outfalls within the town that drain stormwater from roads and catch basins directly into the estuary and beaches. There are no point-sources of pollution, defined as direct discharge, water waste treatment plant discharge, sewer overflows or overboard discharges from boats, within Ogunquit.

The Town has undertaken steps to improve its management of stormwater. Ogunquit's DEP 319 Grant helped fund several catch basin installations designed to filter runoff before it enters the estuary. These include:

- Lower parking lot catch basin
- Town Lyne Motel catch-basin
- Three R-Tank catch basins at Maine Beach Parking Lot, where an existing design directs all outflow from the parking lot areas and properties to Riverside Beach.

According to the US Environmental Protection Agency (EPA), common stormwater pollutants include:

- Soil, sand, and sediment carried by wind and water, from disturbed land including construction and gardening.
- Salt from snow plowing, which is neither treatable nor able to be removed with filters.
- Chemicals from pesticides, lawn care, vehicle fluids, brake dust, oil and gasoline spills, etc.
- Nutrients such as nitrogen and phosphorus.
- Pet waste. Town Ordinances prohibit dogs in the estuary, dunes and on the beach at specific times of the year and fines have been instituted for non-compliance. Public education has also been conducted.
- Wildlife waste, carrion.
- Debris, such as litter, leaves, lawn clippings.

Pollutants in stormwater have many sources, but according to the EPA, land clearing accounts for the majority of the contribution and is the easiest for the Town to address. Effects of pollutants caused by land clearing include increased mobility of the soil to waterways in runoff; loss of filters and buffers that help infiltrate runoff, protect fragile edges, and remove bacteria; increased turbidity of streams and rivers leading to decreased penetration of sunlight; increase of nutrients in water leading to algal blooms and deoxygenation; release of toxins that were previously bound to soil; mobilizing weed seeds, rhizomes, carried by waterways to new sites; and bank erosion from increased quantity of runoff from destabilized sites.

Water quality monitoring and assessments in Ogunquit have shown that many bacterial contamination issues in the coastal waters of town emanate from non-point sources that are far removed from the beach. Bacteria from pets, wildlife, or human waste can enter the waterbodies in stormwater runoff or from malfunctioning septic systems and leaky sewer lines. A 2021 Water Quality Monitoring Report by FBE noted:

Monitoring work in the Ogunquit River has largely focused on the fecal indicator bacteria Enterococcus. The presence of elevated levels of Enterococcus in a saltwater body like the Ogunquit River estuary can mean that other pathogens contained within fecal waste are present and may make swimmers sick through contact or ingestion. Elevated fecal indicator bacteria (Enterococci) levels above applicable public health thresholds have been found at sampling sites throughout the Ogunquit River's lower tributaries and the estuary. Locations where frequent high fecal indicator bacteria counts are observed, so called "hot spots", have been found along Leavitt Stream and the tributary that drains Robie's Pond and flows directly to the estuary north of Littlefield Village.

Recent (2021) water sampling by FBE showed a continuation of elevated fecal indicator bacteria at a stormwater outfall pipe that collects flow from catch basins in the Main Beach parking lot and Beach Street to the Ogunquit River at Riverside Beach. The retrofitted catch basins are designed to treat all stormwater runoff from their drainage area (a portion of the parking lot) in all but the largest rain events. Installation of another enhanced dry well and specialized bacteria filter cartridges to reduce bacteria from the new catch basins was completed in 2021 as part of the Maine DEP/USEPA 319 Watershed Assistance Grant Phase III project.

Water quality is actively and regularly monitored along Ogunquit’s rivers, estuary, and beaches. Example monitoring efforts include:

- Maine Healthy Beaches (MHB), an EPA sponsored program, partners with local municipalities to routinely collect water quality data at beaches along the coast. MHB has been monitoring the rivers, estuary and health of Ogunquit’s beaches from 2003 to the present. MHB, along with Ogunquit Lifeguards, regularly tests for bacteria from May to September in designated locations along the coast. Five beaches in Ogunquit are part of the program: Riverside Beach and four beaches outside the Ogunquit River estuary (Little Beach, Main Beach, Footbridge Beach, and Moody/North Beach). Riverside Beach and Little Beach show exceedances of bacteria much more frequently than Moody/North, Footbridge, and Main, as reflected by monitoring data from 2021 (**Figure 1**) and from previous years.

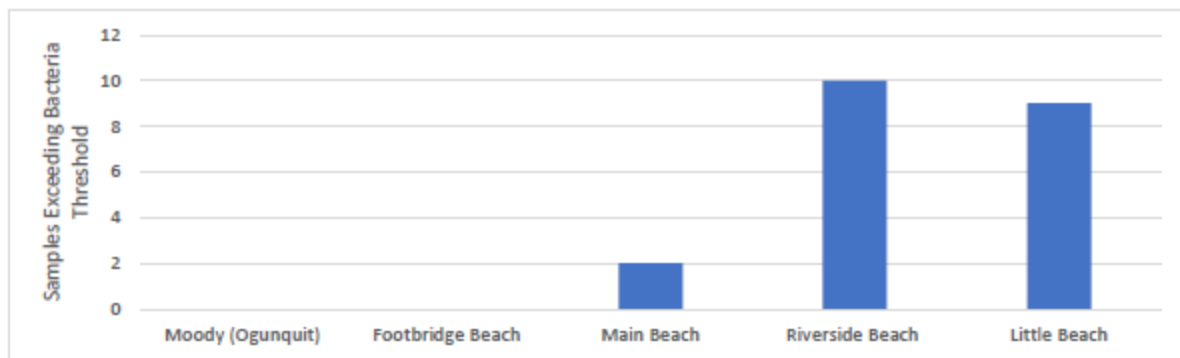
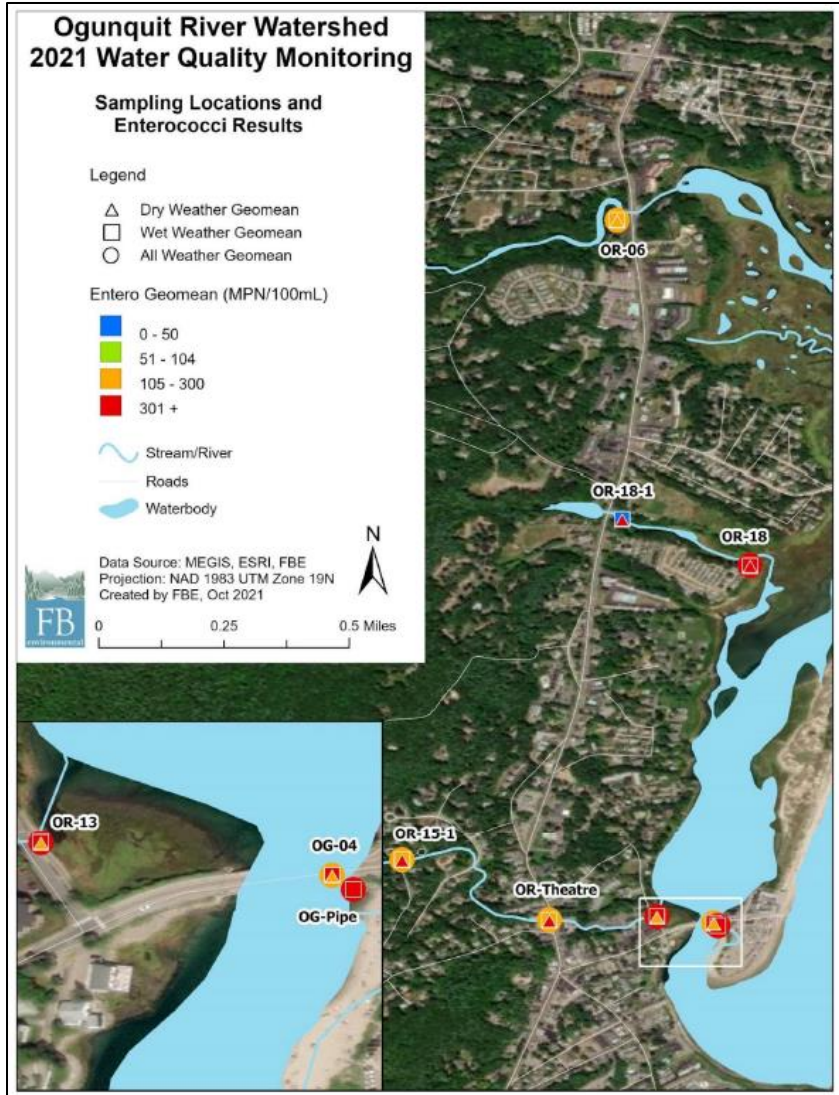


Figure 1 Maine Healthy Beaches 2021 sampling events exceeding the Enterococcus Beach Action Value (104 mpn/100mL) for beaches in Ogunquit. Data courtesy of Maine DEP Maine Healthy Beaches Program. (Source: Chart and caption: 2021 Water Quality Monitoring Report, FB Environmental Associates)

- The Ogunquit Sewer District (OSD) independently conducted bacteria tests from 2014-2022 at bacterial “hot spot” locations in the Ogunquit River, as well as salt pan areas in the estuary in Ogunquit and Wells. In addition, in 2014 smoke tests were performed in shoreland areas identified as vulnerable to septic system malfunctions. Malfunctioning systems were identified, and landowners were notified of the results.
- Healthy Rivers Ogunquit (HeRO), a subsidiary of Wells Reserve at Laudholm, collaborated with the Town of Ogunquit to conduct an eight-day testing initiative of the Ogunquit River outflows coming from every pipe entering the estuary in September 2021. Results showed that bacteria levels were elevated at every low tide on every day of the testing.
- FB Environmental Associates, as part of a DEP 319 grant, from 2014 -2022, conducted tests for Enterococci in designated locations in the estuary, Ogunquit River, and Leavitt Stream and its tributaries (**Map 2**).

Ogunquit and its partners have been working for more than a decade to remediate water quality issues and impairment of local waterbodies through nonpoint source pollution control and monitoring changes in water quality. The Town of Ogunquit’s Conservation Commission and Sustainability Committee, FBE, Acorn Engineering, Maine DEP, and other entities have been actively partnering on initiatives to improve water quality and reduce bacteria levels in the Ogunquit River Watershed and at the public beaches. One such effort is The Ogunquit River Watershed Restoration Project, which has been ongoing since 2007 and has included the following:

- A 2007 Watershed-Based Management Plan produced in partnership with the Wells Reserve.
- A 2013 Watershed-Based Management Plan update that included a watershed survey for nonpoint sources of pollution.
- Three implementation projects, referred to as [Phases I, II](#), and III, carried out from 2014 to 2022, that resulted in structural nonpoint source pollutant controls and involved educational outreach, funded in part by Maine DEP. A fourth phase has been funded and is slated to begin in 2023.
- A septic system vulnerability assessment and comprehensive septic system database for all four towns within the watershed.



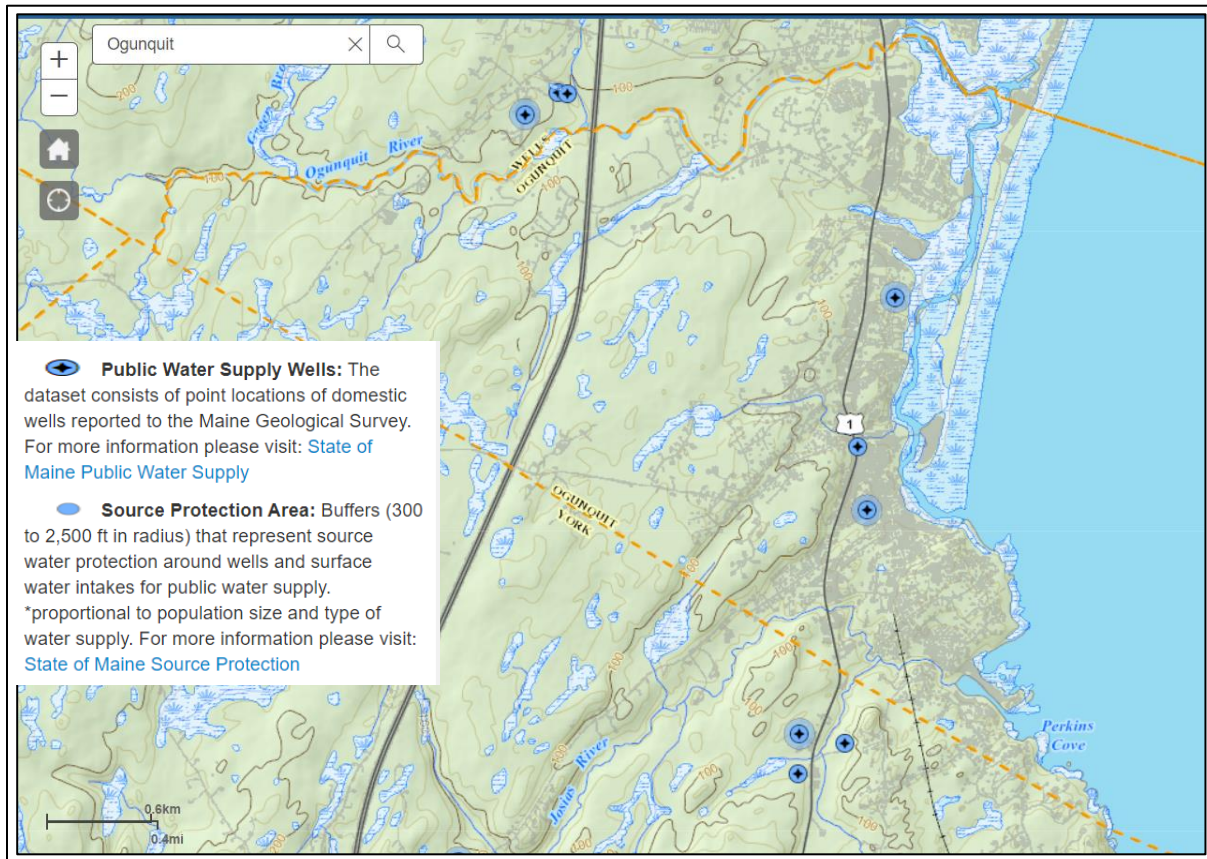
Map 2 Ogunquit River Watershed 2021 water quality monitoring sites. (Source: 2021 Water Quality Monitoring Report, FB Environmental Associates)

Drinking Water Supplies

Drinking water in Ogunquit comes from private wells and from the Kennebunk, Kennebunkport, and Wells Water District (KK&WWD). There are three public water supply wells in the town, all of which are located along the Route 1 corridor (*Map 3*). Two of the three are within source

protection areas. The digging of private wells must comply with Town Ordinances and State guidelines. There are no mapped aquifers located within Ogunquit.

The KK&WWD complies with federal and state regulations requiring routine monitoring for chemical and microbiological contaminants. KK&WWD performs over 15,000 water quality analyses through online instruments and grab samples each year, greatly exceeding the number necessary for compliance. Water quality is examined at the source(s) of supply, throughout the treatment process and ultimately at the consumer's tap. Alkalinity, pH, iron, disinfectant concentration, disinfection byproducts, lead, copper, fluoride, and turbidity are parameters routinely monitored in the distribution system.



Map 3 Public water supply wells and source protection areas in Ogunquit. (Source: Beginning with Habitat)

Best Management Practices and Regulatory Protection of Groundwater and Surface Water

The Ogunquit Public Works Department is responsible for the maintenance of all public infrastructure in the town, including storm drains systems, culverts, water catch basins, street cleaning and snow plowing and removal. Ogunquit treats its roads with salt in the winter during periods of icy and snowy conditions. Salt and sand, which is used during certain storm

conditions, are stored in separate undercover piles at the Department of Public Works facility. Snow that is collected via removal is deposited in a pit off Berwick Road.

The Town's Zoning Ordinances and Subdivision Regulations govern the practices that developers must follow to avoid environmental impacts including erosion, mass soil movement, and water pollution before and after construction. Ordinances also contain storm drainage design standards and storm construction standards.

Ogunquit also has an ordinance that prohibits the use of non-organic pesticides and herbicides. This is applicable to all turf, landscape and outside pest-management activities conducted within the Town of Ogunquit, on both public and private land. The purpose of the code is to safeguard the health and welfare of the residents and visitors and to conserve and protect the Town's groundwater, estuarine, marine and other natural resources, while ensuring preservation of the land.