Keyport's Municipal Water Story

prepared by the

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October 2026

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INTRODUCTION

The Keyport Green Team was created by Borough Resolution #108-09 in April 2009. Green Teams exist in nearly every NJ municipality and is required before a municipality can pursue and obtain a certification under Sustainable Jersey. Sustainable Jersey is a "nonprofit organization and national leader in the local sustainability movement". *Sustainablejersey.com*

At the start of each year, the Keyport Green Team selects action items that it plans to complete from Sustainable Jersey's approved list of action items. Its volunteers work to complete their selected action items in accordance with Sustainable Jersey's guidance and requirements, and to monitor their progress toward annual certification based on points given for completed actions. When Keyport is certified, the Green Team will also help to write requests for grants that are made available through Sustainable Jersey. However, more important than the occasional grant opportunities, are the benefits Keyport receives from projects that result in municipal cost savings, environmental stewardship achievements, quality of life improvements and education for our residents.

The Keyport Green Team chose to explore our water story to identify, educate and to provide actions for the municipality, county and affiliated agencies as well as for residents. We looked at our surface waters, water recreation, drinking water, wastewater and stormwater. Through our research, we wanted to give our community accessible, practical information, and encourage them to join us in looking to the future. We recognize there will be a need for ongoing dialogue and documentation between all parties so we recognize that this is a continuous process.

As we proceeded, we noticed some problem areas. Flooding is a major problem in Keyport. The area on lower Beers Street floods every time it rains. There are areas along Henry Hudson Trail that are flooded with heavy rain. These are only two examples of flooding in Keyport. A Master List of problem areas that regularly flood should be developed so that possible solutions can be explored. Residents can help identify areas and solutions. For instance, a resident who lives near the Henry Hudson Trail noted no flooding occurred for two storms after the County cleaned out the ditches along the trail. This is a small example of identifying a problem and finding a relatively easy solution.

The surface water in the Creeks and the Bay often have high bacteria counts for *enterococcus*, a bacterium that can cause illness. The stormwater runoff often carries organic matter in the form of leaves and grass clippings into the Bay, causing low oxygen conditions, which tend to affect aquatic life. These problems can limit recreational opportunities in Keyport, an area that prides itself in its Bayshore life. We would like to hear more from residents about their interactions with local waterways and ideas for mitigation to the concerns they face. We view this project as a way to further understanding of our local water story, share that story with the stakeholders in our borough, and to create a dialogue

between all members of the community on how we can foster an appreciation of our Bayshore for generations to come.

HISTORY

The Raritan Bay is at the heart of Keyport's development. The Lenape harvested oysters here for a food source and may have used sharpened shells as knives. In 1714 the Kearney family established an 800-acre plantation known as Key Grove Farms. It operated from 1714 until 1849. The early settlement engaged in farming, timber production, shipping and oystering. Over time, Keyport became a hub for Monmouth County to ship produce and products to New York City. In 1850 a boatyard was established which made steamboats, including vessels used in the Civil War.

The Kearney family harvested and replenished oysters in the Luppatatong Creek for market. These oysters, known as the "Chingarora oysters" were of very high quality and in great demand. J and JW Elsworth Company, the largest oyster company in the country, opened a plant in Keyport in 1899 on the Luppatatong Creek. Oyster boats would harvest the oysters in the Bay and transfer them up the Luppatatong where the oysters purified themselves by "drinking" fresh water. Then the oysters were shucked and packaged at the Oyster House plant to be sent to cities across the country. The plant closed in 1936.

The Aeromarine Plane and Motor Company was an early manufacturer of aircraft on the east end of Keyport. It covered approximately 50 acres with the Chingarora Creek as the eastern and southern boundary and the Raritan Bay as the northern boundary. After starting with small experiments with a small business in Keyport, it was officially founded in 1914. The company built military seaplanes and flying boats.

The town of Keyport was established in 1870 and became a borough in 1908. It covers 1.4 square miles and in the 2020 census had a population of 7,204 residents. Keyport has a quaint downtown, many restaurants and recreational opportunities. A waterfront park, which features a promenade along the Bay, a gazebo and a rain garden, is a hub for community events. Three of our 4 borders are water bodies. Keyport is called "The Pearl of the Bayshore" because of our beautiful waterfront parks and our history of oystering.

Keyport Historical



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Keyport

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Delaware Geological Survey - New Jersey/Delaware boundary data through the Delaware River within the 12 mile circle centered on the old New Castle County Courthouse (Used prior to 1881)

New Jersey Department of Agriculture, State Agricultural Development

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CHAPTER 1 – WATER RESOURCES IN KEYPORT

Hydrologic Setting

Keyport is part of the Raritan Sandy Hook Bay watershed and the Atlantic drainage basin. It is also in Monmouth Watershed Management Area 12. Watersheds are areas of land where all the water bodies and rainfall drain to a common outlet like a bay. Keyport is on the downstream confluence of watershed basins meaning Keyport's streams flow into Keyport Harbor, an arm of the Raritan Bay. Keyport's upstream communities affect our water. Our upstream municipalities are Holmdel, Matawan and Hazlet. Conversely, there are downstream communities who are affected by our water flow. The downstream municipalities are Union Beach, Atlantic Highlands and Middletown. Water doesn't know boundaries. Good working relationships with our neighbors, both upstream and downstream are essential for the health of our environment.

Keyport Harbor is located on the south side of Raritan Bay. It is a shallow harbor. The Borough's frontage on the Bay is .38 linear miles, with 3 tidal water bodies entering Keyport Harbor. Two of these creeks, Matawan and Chingarora enter the harbor at the boundaries for Keyport. The Luppatatong creek enters closer to the western border.

The Matawan creek flows north from Marlboro to Keyport Harbor covering 1,100 acres. It starts as a freshwater creek with many tributaries but below the Ravine Drive dam in Matawan, it becomes a tidal estuary passing through salt marshes. It passes under the Garden State Parkway and State Route 35. Small recreational boats can navigate it. The Matawan Creek enters the Bay at the western boundary of Keyport by Cliffwood Beach where Brown's Point marina is located.

The Luppatatong creek originates in the Mt Pleasant hills in Holmdel. The creek has multiple tributaries joining it as it flows north, turning into a tidal estuary. This creek passes under the Garden State Parkway and Route 35, going underground in some places. The creek enters the Bay at the Keyport Fishery.

The Chingarora creek originates in Hazlet township. Tributaries join the creek as it flows north turning into a tidal estuary as it flows into the Bay. It passes under Route 35 and Route 36, going underground in some places. As the creek flows to the Bay, it goes along the east and south side of the Aeromarine site entering the Bay on the boundary with Union Beach.

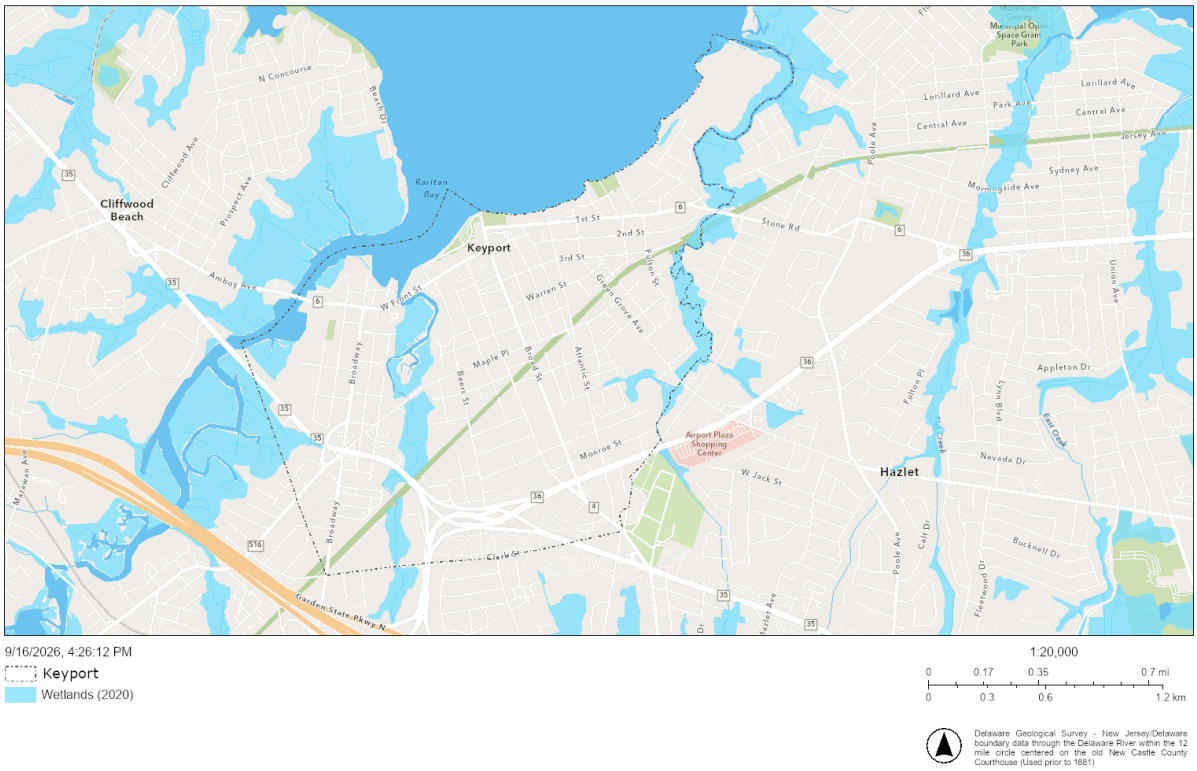
Wetlands

Wetlands are unique environments that exist between terrestrial land and bodies of water. They are wet environments with water at or very close to the surface. Wetlands have many important functions. They act as flood control, shoreline stabilization and protection from storm surges. Wetlands are habitats that support biodiverse ecosystems providing water purification, nutrient cycling, carbon

sequestration and sediment retention. There is a great variety of wildlife, plants and macroinvertebrates which start food webs in wetlands. In Keyport, wetlands exist along the sides of the creeks that enter the Bay. These saline marshes are identifiable by the types of grasses that grow in them. These include cord grasses, cattails, reeds and brush. New Jersey has classified wetlands into 3 categories. They are exceptional, intermediate and ordinary resource values. Keyport has ordinary wetlands as they originate from streams that cannot support a trout habitat.

The wetlands are comprised of salt marshes and tidal estuaries. These nutrient rich environments support clams and oysters. There are crabs in the Bay as well as small fish. Northern diamond-backed terrapin live in these environments. Ribbed mussels attach to the base of grasses.

Keyport Wetlands 2020



Keyport has 2 sandy beaches along the Raritan Bay. One is at the end of Broad Street and the other is at Cedar Street Park. The Cedar Street beach faces threats from rising sea levels, storm damage and severe erosion. Invasive plants are rapidly replacing native species. One solution for protecting the beach is developing a Living Shoreline. A Living Shoreline is nature-based stabilization of coastal areas to protect against erosion. The living shoreline replaces bulkheads by using native grasses, plants, oysters and sand to absorb wave energy and reduce erosion. The Keyport Environmental Commission had plans to develop a living shoreline at Cedar Street Beach. Through networking with Kean University

professors, the EC partnered with Kean University students who elected to develop a plan for a living shoreline at Cedar Street as a Capstone project. The students submitted a comprehensive report, but the permitting process has been slow. Although the wooded area has sustained damage to trees over the intervening years, the report continues to be relevant and could be used to guide improvements in the area.



The shoreline in Keyport is important in supporting diverse aquatic ecosystems. Horseshoe crabs live in the Bay and are considered vulnerable due to habitat loss, overharvesting and biomedical demand. Horseshoe crabs produce large numbers of eggs which are food for birds, turtles and larger aquatic species. Adults feed on the seabed helping to aerate the sediment which improves habitat quality for other marine species. Keyport is part of Save Coastal Wildlife's horseshoe crab count every spring at Cedar Street Beach. The counts monitor population trends over time.

Ospreys were taken off the endangered list in January 2025 and upgraded to stable secure due to breeding success. These birds are a part of the ecosystems in the Bay with Keyport Harbor having a

nest near the municipal boat ramp. Many shore birds depend on wetlands to nest and rear their young. Snowy Egrets are considered of special concern during the breeding season. Since 1976, populations have been in decline due to habitat loss, degradation of wetlands and disturbances to nesting areas. Keyport's tidal estuaries offer Snowy Egrets a place to breed.

The Living Shoreline report submitted by Kean students cataloged native and invasive species in the dunes and wooded area. There are native trees, identified as hackberry, black cherry, red maple, northern catalpa and blackjack oak. Beach plum, northern bayberry, goldenrod and prickly pear are more native species that were identified. American beach grass is also present. The report stressed that the invasive plants are more numerous and are taking over the area.

Surface Water Quality

Streams are classified based on their designated usage, including boating, swimming, fishing, shellfish harvesting and drinking water. New Jersey uses surface water quality standards (SWQS) to ensure water ways are safe for all designated uses. Our creeks are classified as FW2-NT-SE1. What do all those abbreviations mean? Fresh waters are classified as FW1 and FW2 waters. FW1 is for streams that are not subject to manmade waste discharges. FW2 is for all other fresh waters. Freshwaters are also classified based on trout habitats. NT means no trout habitat present. SE1 is a general classification for saline estuaries. The creeks change from freshwater at their source to brackish waters as they journey north to the Raritan Bay. Due to our designation of FW2 -NT-SE1 our creeks and harbor are considered non-attaining for fish consumption or support of aquatic life. The Raritan Bay west of Thorns Creek is non-attaining for general use, shellfish or fish consumption. Boating is allowed. Swimming is allowed on Broad Street beach depending on bacteria counts.

Another measure of surface water quality is antidegradation designations. These designations for water bodies maintain and protect surface waters from being degraded or further degraded by pollution. There are 3 tiers. Each tier has parameters for analysis of proposed discharges from new sources. The top tier is for Outstanding National Resource waters (ONRW) which have stringent rules to protect them from pollution. The next two tiers are C1 waters and then C2 waters. These waters have varying levels of pollution. Our creeks are tier C2.

Impairment of our surface waters took decades to happen. Over time harmful effects from industrial and agricultural toxins made their way into streams. Increased development meant more lawns being treated with fertilizers and pesticides and more impervious surfaces meant more run off into streams along their entire length. Federally mandated protection for this natural resource was enacted only 75 years ago. The first federal legislation to protect water was passed in 1948. In 1972 this legislation was reorganized, expanded and strengthened and is referred to as the Clean Water Act.

Water Quality Monitoring

New Jersey assesses water quality by gathering specific data on the health of our waterways. There are five water sheds in New Jersey and they are monitored on a rotating basis for surface water quality. The State has established Total Maximum Daily Load (TMDL) for eight substances; phosphorus, dissolved oxygen, pH, nitrogen, total suspended solids, mercury in fish tissue from air deposition, PCBs and fecal coliform. TMDL is the maximum amount of pollutants the waterway can absorb and still meet surface water quality standards. The eight measurements point to different issues and thus different solutions. A TMDL Implementation Plan can be developed when a pollutant is causing designated use impairment. The Implementation Plan identifies how to counteract the pollution based on the specific pollution source. The source may be a point source (one source) or non-point source (multiple sources like runoff from streets and lawns). The NJDEP addresses point sources while municipalities find solutions for non-point using education, ordinances and/or grants to return waterways to acceptable water quality standards.

Testing water pinpoints what issues are occurring and the means to figure out the source and possible solutions. Phosphorus and nitrogen are present in fertilizers, animal waste and storm water discharge. Both are essential nutrients for aquatic life, but excessive levels lead to algae blooms and low oxygen levels (dissolved oxygen). Fish and insects are adversely affected by low oxygen levels. Another cause of low oxygen conditions is organic pollution from leaves and sewage. PCBs along with chlordane and DDT are banned pesticides that degrade slowly. They are often found in fish tissues. Fecal coliform indicates contamination by human or animal waste. It indicates the presence of enterococcus bacteria on salt/marine beaches or E. coli in fresh water. Both bacteria cause illness. The pH has a safe range but large fluctuations or out of range pH stresses many species resulting in low reproduction, slow growth, disease and death. pH changes occur from acid rain, fertilizers, industrial waste and natural processes from plant photosynthesis. Total Suspended Solids measure the dry weight of non-dissolved particles in water. It is caused by soil erosion, urban stormwater, industrial runoff, decaying plants and animal waste. Reduced water clarity reduces light, traps heat and clogs fish gills. Mercury in the water is caused by air deposition and is measured in fish tissues. Understanding the meaning of tests helps communities find solutions.

Three of Keyport's water bodies are on the impaired list kept by the EPA under the Clean Water Act known as 303(d). Matawan Creek has mercury impairments based on the concentration in fish tissue. Also found in the water were DDT, low oxygen, fecal coliform, enterococcus, E coli, chlordane in fish tissue and PCBs in fish tissue. Chingarora Creek has enterococcus, fecal coliform, low oxygen, mercury in fish tissues, PCBs, DDT and chlordane in fish tissues. The Raritan Bay west of Thorns Creek in Union Beach has acid pH, fecal coliform, low oxygen, PCBs, chlordane and DDT. The Luppatatong is listed under category 5 impaired waters by the NJDEP. It has enterococcus, fecal coliform, phosphorus and nitrogen which cause algae blooms.

Each of the creeks that enter the Keyport Harbor pass under highways. The runoff from the Garden State Parkway, Route 36 and Route 36 contribute to toxins entering the Harbor. In winter, road salt (sodium chloride) impacts our creeks. Chloride is very soluble and runs off treated pavements without soil filtration, raising salinity in our creeks which is toxic to fish and insects.

Keyport is surrounded by water on three sides. There is a problem with animal waste going into our water ways as evidenced by the presence of fecal coliform and enterococcus in all four water ways. All the creeks entering Keyport Harbor have multiple tributaries passing through suburban neighborhoods increasing the non-point source for fecal contamination. Dog waste that is not removed by the owners will eventually end up in our waters. Swans and seagulls in the harbor contribute to fecal waste in the Harbor.

Keyport does not have a new issue but does have an issue that has never been addressed fully. Multiple studies have been done at the Aeromarine site on the eastern side Keyport, but no action ensued to clean up and properly cap the landfill. It opened in 1962 and closed in 1979. In the early 1980's, strict controls were placed on landfills. The Aeromarine landfill is a legacy landfill because it operated before controls were established. Testing at the site is being conducted.

A potential threat is the Transco Northeast Supply Enhancement Project (NESE) pipeline. It will enter the Raritan Bay near Perth Amboy and go 23 miles to New York, digging up the bottom of the Bay and disturbing superfund sites. The community is concerned about the potential for disturbed toxins to be pushed into Keyport during a hurricane or a super storm like Sandy. Keyport has sail boats and motorized boats that use the Harbor and contribute to our economy and recreational opportunities. Spillage would affect our home adversely.

Actions in Keyport to address water quality concerns:

*The Green Team hosted a series of talks for residents. Two of the topics were Drought Resistant Gardens and one on being a Beekeeper.

*Environmental Commission asked eighth graders at Central school to design a flyer about stormwater best practices to be put in the June water bill. Two members of EC are members of Northern Monmouth Watershed Alliance. EC helps run Clean Ocean Action's beach sweeps twice a year at Cedar Street, involving multiple groups of all ages.

* Ordinances – salt storage parameters for salt storage on private property and new harbor ordinances to keep Harbor clean. Ordinances are listed in chapter 5.

* Dog waste bag stations in all parks and along our promenade with 2 new ones added recently so all 4 entrances to promenade have them.

*Borough has submitted three grant applications to improve our surface waters including:

Beers Street Stormwater Outfall Replacement pipe (Luppatatong Creek)

Cedar Street Park Upper Dune Restoration (using Kean University Capstone Project)

Keyport Bayfront Living Shoreline and Coastal Habitat Restoration (From Cedar Street Park to Chingarora tidal estuary outlet into the Bay)

CHAPTER 2 – COMMUNITY ACCESS TO WATER

Keyport's access to Raritan Bay has defined the character of the Borough since its creation in 1908. The natural beauty and history of the Raritan Bay coastline have long been a source of community pride and continue to provide an important economic benefit, as reflected in the many visitors who use Keyport's public access facilities and patronize local businesses. The Borough currently has several facilities that serve as major access points to its waterfront, including Keyport Waterfront Park and its waterfront path and fishing pier, the Keyport Municipal Boat Launch, Mini-Park, Walnut Street access, and Cedar Street Park and the adjacent waterfront areas.

Access to the water is mainly public in the Borough of Keyport, provided by the Borough and consists of a variety of access points and facilities, including a municipal boat ramp, waterfront walkways, a fishing pier, public parks on the waterfront, small beaches, and associated parking. There are also privately owned marinas along Keyport's waterfront that provide maritime services to the general public. The public parks along the waterfront contain amenities such as walkways, benches, trash receptacles, a tee-ball field, parking, and open space.

All public access points in Keyport provide access to the Raritan Bayfront. The Borough protects, ensures, and maintains public access through its Public Works Department, Recreation Department, Borough Harbor Commission, enforcement of local ordinances, volunteer-based community cleanups, and boat launch fees. The Harbor Commission is vested with the power and responsibility to manage, operate, and control the harbor and waterfront lands owned or leased by the Borough. Its responsibilities include operation of the harbor as well as construction and maintenance of waterfront amenities such as beaches, piers, bulkheads, jetties, the fishing pier, and the municipal boat launch. The Commission and the Borough share the goal of maintaining and enhancing the quality and quantity of public access facilities and opportunities throughout the Borough. Therefore, the overall goal of this Municipal Public Access Plan is to maintain and enhance all existing public access locations to and along tidal waterways and their shores while identifying opportunities to expand public access.

Water Use

The public uses Keyport's water features and waterfronts for a variety of recreational activities, and most of these areas are open and accessible to everyone. Fishing, crabbing, boating, kayaking, canoeing, walking, bicycling, and general outdoor recreation are common throughout the community. The Keyport Waterfront and Promenade along American Legion Drive serves as a central recreational area for fishing, crabbing, waterfront views, community events, and leisure activities. The municipal boat ramp provides access to Raritan Bay for boat launches, kayaking, and canoeing, while the Keyport Fishing Pier is a popular location for fishing and crabbing. Other public recreational areas include Veterans Park, Benjamin C. Terry Park, Cedar Street Park, Keyport Beach Park and Playground, and the

Henry Hudson Trail. Municipal bridges leading toward Union Beach are also commonly used for fishing and crabbing. While most of Keyport's waterfront and recreational areas are open to the public, some water features and shoreline areas have more limited access, including the members-only Keyport Yacht Club and privately owned waterfront properties, such as homes along First Street. Overall, Keyport provides numerous publicly accessible opportunities for residents and visitors to enjoy the waterfront and surrounding recreational areas.

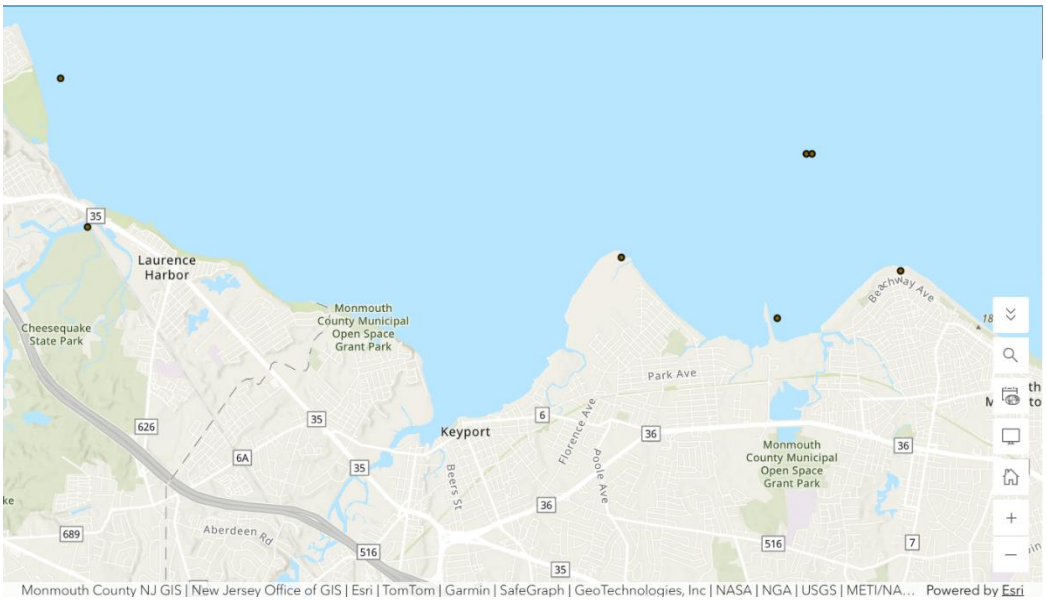


Borough of Keyport MPAP

Residents are generally aware of the conditions that can clog local streams, drainage systems, and waterways, as well as blockages that may impair access to waterways. Common causes include leaves and seasonal vegetation, yard waste, snow and ice accumulation, storm debris, and impacts from significant weather events such as Superstorm Sandy in 2012 and the 2026 winter snowstorm. The municipality has also evaluated stormwater and drainage conditions through planning efforts, including its October 30, 2020 Stormwater Management Report. Local and regional fishing, boating, canoeing, kayaking, and other recreational users have identified additional issues affecting Keyport's public waterways and access areas. These include tidal depth and dredging needs near the municipal boat ramp, limited parking and launch-area congestion, temporary access restrictions associated with waterfront improvement projects, coastal flooding, and water-quality concerns following major storms. Litter, marine debris, and shoreline erosion can also affect accessibility and recreational use. Together, these conditions demonstrate the importance of maintaining clear waterways, drainage systems, and public access areas to support continued recreational use of Keyport's waterfront.

Recreational Fishing

Keyport's local waterways, including the Raritan Bay waterfront, are widely used for recreational fishing and crabbing. While these waters provide important recreational opportunities, water quality, fish and crab consumption advisories, and public awareness of any health-related warnings or posted signage remain important considerations for safe recreational use. NJDEP provides statewide and regional fish and crab consumption guidance that applies to marine and estuarine waters such as Raritan Bay, although no Keyport-specific fish or crab consumption advisory was identified in the information reviewed. Water quality conditions can change, as demonstrated in 2025 when swimming was temporarily restricted due to elevated fecal bacteria levels where it reached levels of 570 CFU/100ml in September of that year, which is five times the safe level. In August 2024, the EPA also posted signs along the beach warning the public not to touch potentially affected materials due to the presence of slag. Residents can access current fish and crab consumption information through NJDEP, Monmouth County health resources, and local news outlets such as News 12 New Jersey. While this information is publicly available, additional signage and outreach at popular fishing and crabbing locations could further improve awareness among residents and visitors.



NJDEP Fish Advisory Locations of NJ

The local health department does not currently conduct specific outreach to warn the fishing community about potential health hazards, but NJDEP and the New Jersey Department of Health provide statewide fish and crab consumption advisories and educational materials for recreational anglers. Advisory signs are posted at some locations around Raritan Bay where potential concerns have

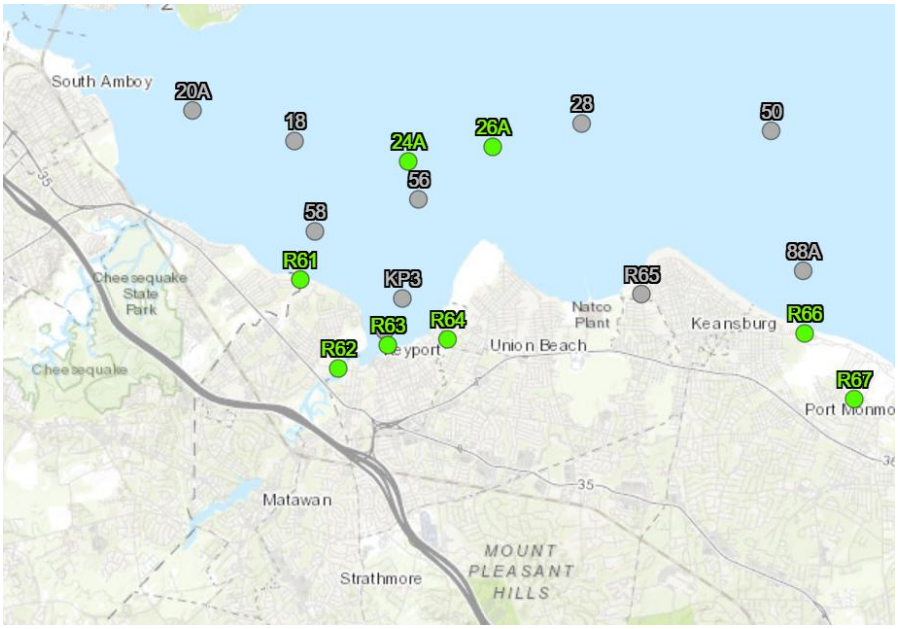
been identified, although a review of all public access points would be needed to determine if signage is present at every appropriate location. In August 2024, the EPA also posted signs along the Keyport beach warning the public not to touch potentially affected materials due to the presence of slag.

Harmful Algal Blooms

Keyport's lakes, streams, and beaches are not currently showing any reported harmful algal blooms (HABs), with no Keyport-specific listings identified through NJDEP resources as of June 16, 2026. Because conditions can develop and change quickly, continued monitoring of local waterways remains important. Residents also have access to information about the public health hazards that HABs can pose to people, pets, and wildlife. Contact with or ingestion of affected water can cause skin irritation, gastrointestinal illness, respiratory symptoms, and other health effects, making continued public education and awareness important.



NJDEP Algal Bloom Sampling Status 1



Phytoplankton Monitoring 1

Conclusion

As a waterfront community, Keyport's connection to Raritan Bay is one of its greatest assets. Residents and visitors use the waterfront every day for recreation, fishing, exercise, community activities, and enjoying nature. Continued efforts to maintain a clean shoreline, educate the public about fish and crab consumption advisories, and protect water quality will help ensure that future generations can continue to safely enjoy and benefit from Keyport's local waterways.

CHAPTER 3 – DRINKING WATER SUPPLY AND QUALITY

Public Drinking Water Supply

The Borough of Keyport operates its own public community water system (PWSID NJ1322001). The primary water sources are two local municipal groundwater wells. These wells draw from the upper and middle Potomac-Raritan-Magothy (PRM) confined aquifers. A confined aquifer has layers of permeable sand and gravel that are between areas of impermeable material such as clay. The Borough also maintains interconnections and purchases water from New Jersey American Water for the rest of the year.

From May through August, the Keyport Water Department is responsible for providing and treating the Borough's water supply. Groundwater produced from the Borough's Perry Street well is treated at the Perry Street water plant and then distributed through the municipal water system. For the remainder of the year, water is supplied by New Jersey American Water through interconnections into adjacent systems. The entire Borough is supplied by public water through the two groundwater wells and New Jersey American Water. Many other municipalities, including Aberdeen, Union Beach and Sayreville, as well as NJ American Water, also pull water from the same PRM aquifers as Keyport.

Water Quality

Recent Consumer Confidence Reports indicate that Keyport's water met applicable federal and state drinking water standards. The Borough conducts routine testing and monitoring in accordance with NJDEP and USEPA requirements.

Like many older NJ communities, residents' concerns with water quality are generally focused on lead service lines, aging water infrastructure, temporary discoloration associated with hydrant flushing, and occasional taste or odor complaints. The Borough has actively participated in lead service line inventory and replacement efforts required by state law and is actively advancing design and replacement projects to maintain and replace existing water infrastructure.

Keyport has many homes constructed before 1985 prior to the 1986 federal ban on lead-containing plumbing materials. Due to the older housing stock, there is an increased potential for lead service lines and lead-bearing plumbing components. Lead sampling is ongoing and 40 samples are taken every 6 months from designated locations per NJDEP regulations. The results are within the 90th percentile allowed by NJDEP.

The Borough is actively identifying and replacing lead and galvanized service lines. An inventory of the Borough's approximately 2,993 service lines was prepared in 2024. This inventory was prepared using data gathered during a review of records and the year each structure was built. These data sources contributed to the determination of most of Keyport's non-lead service lines. However, most of the

service lines had unknowns regarding the material used. Using historical records and time of construction, the report conservatively assumed all unknown lines were assumed to be lead. As such, the inventory calculated lead prevalence up to 78% on the customer side and up to 81% on the utility side. These are considered to be conservative assumptions pending field verification.

As lead service lines are identified on municipal projects, they are replaced. All lead service lines are mandated to be removed from all water systems by July 2031. Keyport has acquired state funding to begin this process. During water main replacements over the last several years, any lead services on the utility side have been replaced.

The Keyport web site has information regarding lead that residents may find useful. The water quality results can be found under the Tax and Utility heading. Further into this section, steps are suggested on how to minimize lead in your water use. There were concerns expressed in the survey the Green Team did in the Spring of 2026 about lead. People were unsure whether they had lead pipes and how to determine if they did.

In January of 2022, the Keyport Board of Education identified and tested all drinking water and food preparation outlets within Keyport Central School and Keyport High School. Of 82 samples taken, 10 tested above the lead action level established by the USEPA for lead in drinking water (15 µg/l [ppb]). These 10 sample locations were shutdown with plans to replace and resample prior to use.

On November 9, 2024, Westchester Environmental conducted lead in water testing for both school buildings and none of the samples exceeded the lead action level of 15 µg/l. Following this water sampling, there are no additional short-term actions being taken by the school system.

Private Wells For Water Supply

The Borough is fully served by the municipal public water system. Private residential drinking wells are generally not a significant source of potable water within the Borough. All Borough test results are below the maximum containment level regarding nitrates, arsenic, lead, gross alpha and fecal coliform.

CHAPTER 4 – WASTEWATER

Sewage Facilities

Keyport owns and operates a sanitary sewer collection system consisting of approximately 96,000 linear feet (LF) of gravity collection mains ranging in diameter from 6 inches to 30 inches and approximately 248 manholes. The system is maintained by the Keyport Department of Public Works. Given the age of the system, which is over 100 years old in some areas, pipe materials vary and include older vitrified clay, while newer areas of the system include concrete, ductile iron, and polyvinyl chloride (PVC) pipes. The Borough's system includes approximately 2,500 lateral connections servicing both commercial and residential customers.

The sanitary sewer system includes two (2) pump stations: a small, low-flow pump station located on Maple Place and a larger pump station located on Cedar Street.

Keyport's wastewater is conveyed to the Bayshore Regional Sewerage Authority (BRSA), which operates a regional wastewater treatment facility in Union Beach. The BRSA was established in 1974 and currently serves more than 90,000 residents across Aberdeen, Hazlet, Holmdel, Keansburg, Keyport, Matawan, Union Beach, and customers of the Western Monmouth Utilities Authority (WMUA).

All of Keyport's wastewater flows to the BRSA's collection system at five (5) primary locations: Waterfront Park along American Legion Drive; a meter chamber located in the Recycling Yard near the intersection of Florence Avenue and Route 36; First Street at Beach Park; the intersection of First Street and Cedar Street; and the intersection of First Street and Walnut Street.

The BRSA wastewater treatment plant operates under a New Jersey Pollutant Discharge Elimination System (NJPDES) permit. Effluent describes water that has undergone treatment to remove pollutants. Treated effluent can be discharged to lakes, rivers, or oceans. The treated effluent from the BRSA is conveyed to the Monmouth County Bayshore Outfall Authority's Union Beach Pumping Station and ultimately discharged to the Atlantic Ocean. According to the BRSA, there will be no need to expand the capacity of the plant for the next 20 years.

Water that goes down the drain becomes wastewater. The Keyport Borough website provides information on how many gallons of water are used for common daily activities. It is interesting to consider how much water we use every day and then multiply that amount by the number of households served by the BRSA to get an idea of how much water is treated every day.

The BRSA states that it "works every minute of every day" cleaning, recycling, and returning water to the environment, treating approximately 2.7 billion gallons of wastewater annually. BRSA flow reports indicate that Keyport represents approximately 10% to 12% of the Authority's treatment flow in recent years, approximately 250 to 350 million gallons per year.

The Keyport Tax and Water-Sewer Utility Office manages utility billing and connections to the system. The sewer charge is 160% of the water charge.

Challenges

One of the persistent issues affecting wastewater collection and treatment systems is the improper disposal of wipes and other materials that are sometimes marketed as "flushable." These include baby wipes, disinfectant wipes, antibacterial wipes, and paper towels. Even products marketed as flushable can contribute to blockages and equipment problems. The BRSA specifically warns residents not to flush wipes and paper towels and to dispose of them in the trash.

Medications, both prescription and over-the-counter, should not be poured down the drain or flushed down the toilet. Conventional municipal wastewater treatment plants are not specifically designed to remove pharmaceuticals, and some medications can pass through treatment and enter receiving waters. The EPA recommends appropriate medication take-back and disposal programs to reduce the amount of pharmaceuticals entering wastewater systems. There is a medication drop box available at Borough Hall.

FOG (fats, oils, and grease) can affect wastewater collection and treatment. These substances can contribute to blockages in sewer pipes and can interfere with wastewater treatment processes. Putting fats, oils, and grease down the drain can also cause problems in household plumbing. Pans can be wiped with a paper towel and thrown away. Larger amounts of FOG can be placed in a container and allowed to cool and solidify before being disposed of in the trash.

Inflow and infiltration (I&I) poses a significant challenge to Keyport's infrastructure by allowing water to improperly enter the wastewater system. Infiltration occurs when groundwater enters the sanitary sewer system through cracks, defective joints, deteriorated pipes, or other defects. Inflow occurs when stormwater or other surface water enters the sanitary system through improper connections or other direct pathways.

During significant precipitation events, I&I can substantially increase the amount of water entering the sanitary sewer system. This additional flow must be conveyed and treated along with the wastewater generated by homes and businesses, increasing the demands placed on the collection and treatment systems.

Vitrified clay pipe, which is common throughout the Borough, can be susceptible to root intrusion and deterioration of pipe joints. Over decades, soil movement and deterioration can compromise the joints between individual clay pipe segments, creating pathways for groundwater to enter the sanitary sewer system.

Because Keyport has a dedicated and separate storm sewer system (MS4), stormwater from streets and catch basins is generally collected and conveyed separately from the sanitary sewer

system. This separation reduces the potential for direct stormwater inflow into the sanitary sewer system, although other sources of inflow and groundwater infiltration can still occur.

Additional I&I entering the system typically increases during and following significant precipitation events. Reducing unnecessary flows into the sanitary sewer system can help reduce operational costs, protect available treatment capacity, reduce the risk of sanitary sewer backups, and protect the coastal environment.

Capital Improvements

The Borough has previously performed rehabilitation projects to the sewer system aimed at upgrading aging infrastructure and reducing I&I. These projects included extensive sewer main lining and manhole rehabilitation completed in 2014. Approximately 21,000 linear feet (LF) of existing 8-inch and 10-inch sanitary sewer mains have been lined. Approximately 75% of the 248 manholes in the collection system have been rehabilitated with a liner.

Recent projects have also included the replacement of approximately 3,000 LF of 8-inch and 12-inch sanitary sewer mains and approximately 100 lateral connections. Additional sewer lining and main replacement improvements are planned as part of upcoming road and utility projects.

These rehabilitation projects extend the useful life of existing infrastructure, reduce the potential for groundwater infiltration, and help the Borough address deficiencies in an aging sanitary sewer system. Past and future projects have been funded by grants and loans from the USDA, USEPA, and NJ Infrastructure Bank.

Groundwater

Because the entire Borough is within a sanitary sewer service area, customers in Keyport do not utilize individual septic systems. While our neighboring communities use the BRSA for wastewater treatment, some rural areas within the broader BRSA service area continue to operate septic systems in locations where sanitary sewer service is not available.

NJDEP's NJ-GeoWeb GIS system provides public access to information regarding contaminated sites and groundwater contamination throughout New Jersey. The NJDEP Site Remediation Profile includes separate GIS layers for Known Contaminated Sites and groundwater contamination.

As of 2026, a review of NJ-GeoWeb data has identified approximately 20 contaminated sites and seven (7) groundwater contamination areas within Keyport associated with historic commercial and industrial activities, including uses such as boatyards and gasoline service stations. Because these GIS layers are updated as site information changes, the number and status of sites can change over time.

Contaminated sites are addressed through New Jersey's Site Remediation Program. Licensed Site Remediation Professionals (LSRPs) oversee investigation and remediation activities in accordance with NJDEP's site remediation requirements, including N.J.A.C. 7:26C and N.J.A.C. 7:26E.

At the present time, the Aeromarine site is being investigated for soil and groundwater contamination associated with the former sanitary landfill, which was closed in 1979. The community has received updates from the Borough Council and investigators working on the site. Two Town Hall meetings have taken place at the High School with representatives of the NJDEP and the site's LSRP. Test results are pending.

CHAPTER 5 - STORMWATER AND FLOODING

Keyport Boro is approximately one square mile in area. Its northernmost boundary is the Raritan Bay, and the East and West boundaries are the Chingarora Creek and Matawan Creek respectively. Near the western boundary the Luppatatong Creek which originates in the northwest side of Holmdel runs from there through Hazlet through Keyport and terminates at the Raritan Bay. Portions of all three creeks empty as estuaries. That is where the fresh creek water and Bay saltwater meet and mix. The brackish water of these estuaries provide habitat for various aquatic flora and fauna including fish, eels, crabs, rib mussels, birds and other invertebrate and vertebrate animals. Along the banks of these creeks there are large wetlands, readily noticeable by the abundance of phragmites; a non-native grass that has overtaken much of the natural salt hay and cattails. The wetlands which are visible on Keyport maps as undeveloped areas adjacent to the creeks, perform an important function by absorbing both incoming tidal flow, local precipitation and upstream runoff. These wetland areas are especially important in mitigating flooding during abnormal high tide events and coastal storms, Nor'easters and hurricanes for example.

Stormwater Management

An introduction to Keyport's stormwater management program is on the Boro's website Keyportonline.com and is as follows:

> "As a New Jersey Department of Environmental Protection (NJDEP) Tier A Municipal Separate Storm Sewer System (MS4) permittee, the Borough is committed to protecting local waterways by implementing a comprehensive stormwater management program. The Borough complies with the requirements of its NJDEP Tier A MS4 permit through public education and outreach, stormwater infrastructure mapping and maintenance, illicit discharge detection and elimination, employee training, and enforcement of stormwater management regulations to help reduce pollution, improve water quality, and mitigate flooding".

On the Boro's website under the dropdown menu titled **Government** it includes a submenu titled **Stormwater** which contains links for the **Stormwater Ordinances** and a secondary submenu that includes **Stormwater Management Information and Mapping**.

The Boro website does not include the actual MS4 Permit as it is no longer a NJDEP requirement, instead it includes Keyport's' **Stormwater Management Infrastructure Map**, **Watershed Inventory Report**, and **Stormwater Pollution Prevention Plan**. It also includes a link to the **Stormwater Management Control Ordinance**. All of these are required by the NJDEP to be posted online. The MS4 Permit is available at the Boro's Clerks Office. The New Jersey Pollutant Discharge Elimination System (NJPDES) Active Permit list on the DEP web shows that Keyport's MS4 Permit No. NJG0149012 is approved with an expiration

date of 12/31/27. The Stormwater Management Coordinator is the Boro engineer, Trevor Taylor of Artheon (f/k/a CME Associates).

Historically, the federal National Pollutant Discharge Elimination System (NPDES) established the legal mandate for stormwater control in 1972 and amended it in 1987,1990, and 1999. New Jersey implemented it locally starting in 2002 through the NJDEP Municipal Stormwater Regulation Program amending it in 2023. In addition to the **Stormwater Management Infrastructure Map**, **Watershed Inventory Report**, the **Stormwater Pollution Prevention Plan** and the **Stormwater Management Control Ordinance,** additional municipal ordinances as required by the NJDPES are listed on the Boro website and shown below:

- Private Salt Storage
- Tree Removal and Replacement Requirements
- Litter Control
- Feeding of Unconfined Wildlife
- Disposal of Pet Waste
- Private Storm Drain Inlet Retrofitting
- Improper Disposal of Waste
- Illicit Connections to Municipal Separate Storm Sewer System
- Sump Pump Discharge
- Yard Waste Collection and Disposal Program

The NPDES is primarily concerned with water pollution. Studies by the Federal Environmental Protection Agency found pollutants in stormwater runoff. Pollutants and their sources included:

> "Benzine and other volatile organic compounds (VOCs) from gasoline, motor oils, and other vehicle fluids (from spills, leaks and accidents}; asbestos and various metals from brake pad and other vehicle component wear and tear, rubber and other material from breakdown of tires, excess phosphorous and nitrogen from fertilizers, various oxygen demanding parameters from coffee, juice, soda, etc. being poured/spilled by pedestrians, excess nutrients and pathogens from various wildlife such as birds, racoons, etc. and illicit connections, salt and related additives and/or impurities from deicing procedures, fertilizer and pesticides from landscaping/lawn areas and soaps and detergents from vehicle washing, or from power washing of decks/sidewalks and buildings". (NJDEP Bureau of NJPDES Stormwater Permitting and Water Quality Management -Fact Sheet)

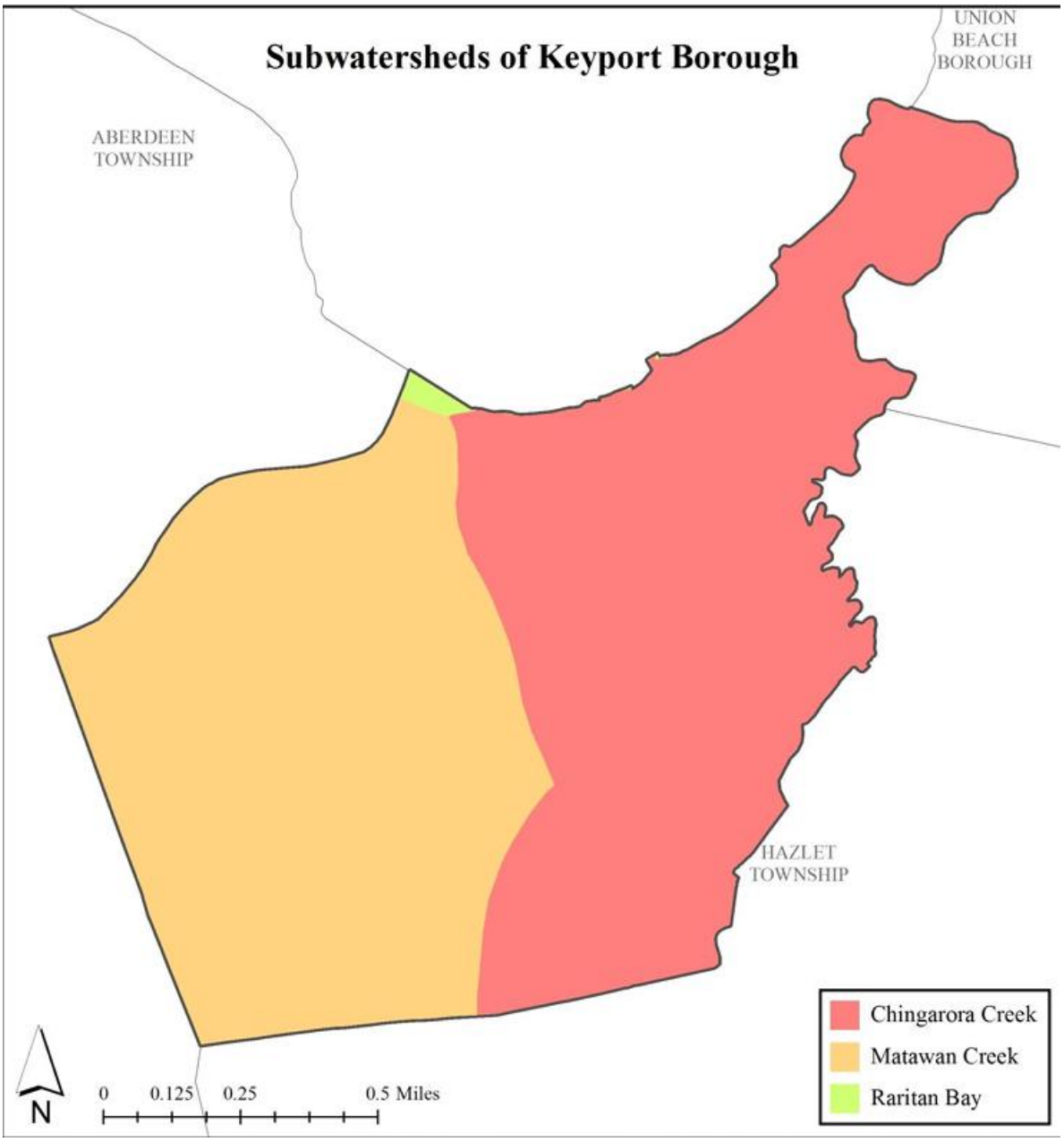
Managing stormwater runoff involves many key infrastructure elements, including roadways, sidewalks, storm drains, outfall pipes, lawns and landscaping, rain gardens, creeks, wetlands, the Raritan Bay as

well as impervious surfaces such as building roofs, driveways, parking lots. In addition, ordinances are necessary to educate and or control the actions of residents and visitors in everyday activities such as properly disposing pet waste, litter, normal household waste, hazardous household waste, and in recycling, feeding unconfined wildlife, and sump pump discharge. All the stormwater ordinances are available on or through the Boro website.

Keyport's Stormwater Management Control Ordinance focuses on meeting the state's baseline safety rules. It did not undertake the recommendations found in the Sustainable Jersey Enhanced Stormwater Management Control Action. Day-to-day maintenance is performed by the Public Works Department. The Boro website includes a poster alerting residents that the stormwater and sewer systems are currently being assessed by the Boro and any residents experiencing any rainwater flooding, sewer backups, or other storm-related issues in the home on the property or in the vicinity, should contact the Boro.

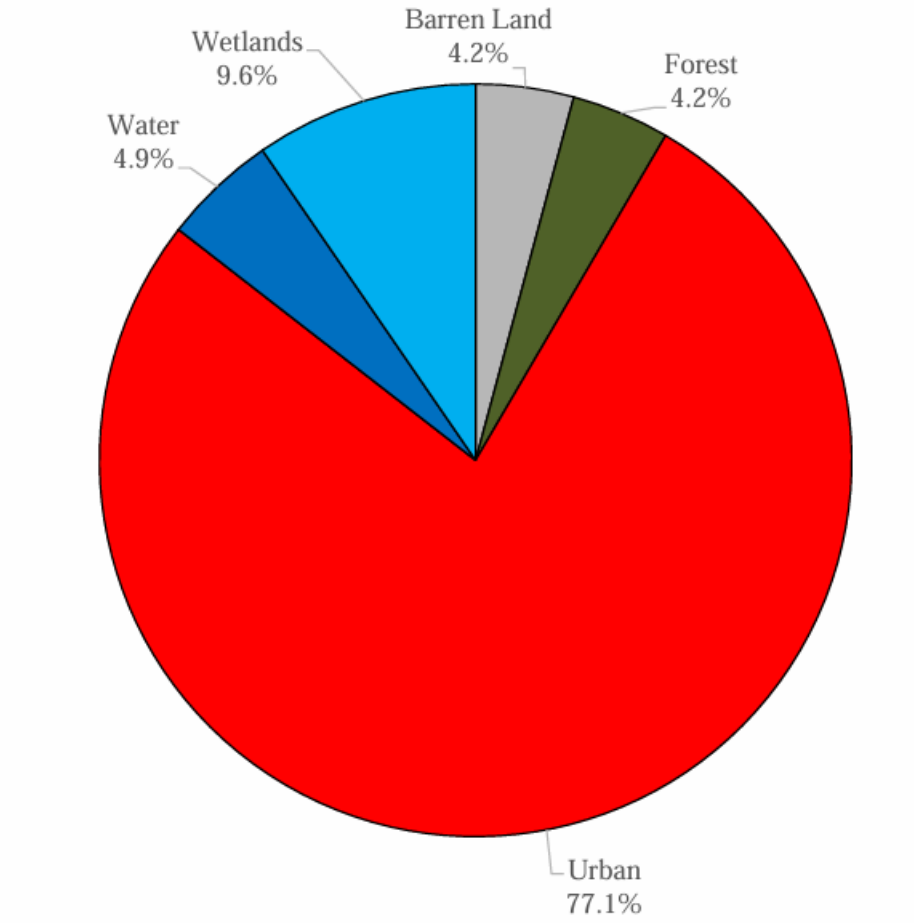
In February 2016 the Rutgers Cooperative Extension Water Resources Program drafted a report "Impervious Cover Assessment for Keyport Borough, Monmouth County, New Jersey" and an action plan "Impervious Cover Reduction Action Plan for Keyport Borough, Monmouth County, New Jersey". Rutgers determined 37% of the acreage of all three of the Boro's subwatersheds were covered with impervious surface. By comparison the report references a study that claimed, "New Jersey had the

highest percent of impervious cover in the country at 12.1% of if its total area (Nowak & Greenfield 2012)".



The Boro zoning code that addresses impervious surface coverage is 25-1-16 of the Land Use Regulations. It sets the maximum percent of allowable impervious surface lot coverage for Residential Districts (RA, RB, and RC) at 60% for all buildings and impervious surfaces, and for commercial districts

at 90%. Accordingly, this means residential lots should have pervious surface lot coverage of at least 40% and commercial pervious surface lot coverage of at least 10%.



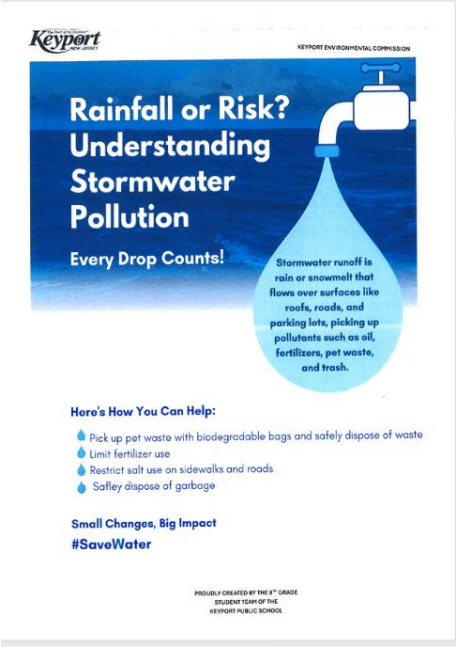
Pie chart illustrating the land use in Keyport Borough

Stormwater runs off impervious surfaces resulting in pollution, flooding and erosion. The Rutgers study recommends reducing impervious surface coverage by eliminating surfaces that are not necessary, reducing or converting impervious surfaces, and disconnecting impervious surfaces from flowing directly to local waterways. The Rutgers' Impervious Cover Reduction Action Plan identified 12 non-residential properties (schools, churches, fire house, library, First Aid, etc.) and 1 residential apartment complex. The impervious surface area of each was identified and measured and a recommendation to decrease the impervious surface was suggested. These recommendations along with cost estimates consisted of either or both replacing existing impervious pavement with pervious pavement and bio retention systems/ rain gardens to achieve the disconnect between impervious surfaces and local

waterways. Two rain gardens, one at the Central School and one at the Waterfront Park promenade, were designed and planted following the Rutgers study.

In addition to the Boro's Public Works Department, the community has been actively involved in projects related to stormwater management. The Environmental Commission has been instrumental in reducing beach erosion in the Cedar Street area through establishing a living shoreline involving volunteer effort to replace invasive Asiatic sedge and plant dune grass. This was a community project supported by Surfrider Foundation and Save Coastal Wildlife who provided dune grass and guidance. The Environmental Commission is working with Kean University's Department of Environmental and Sustainability Sciences. Kean is actively monitoring sand movements and beach erosion along the Cedar Street living shoreline project area reporting and coordinating regularly with the Environmental Commission. Further, as part of a Kean University graduation required Keystone Project a team of graduates created and submitted to the Boro a plan for remediation of the upper dune area of the living shoreline.

The Environmental Commission works with the local school district to produce an annual mailer insert sent with residents' water bills highlighting environmental issues. The last insert was about stormwater pollution. The Commission also works with other school and non-profit groups in beach cleanups and educational activities including Clean Ocean Action Beach Sweeps held twice each year. The commission is also a member of the Northern Monmouth Watershed Alliance and participates in public outreach efforts to fulfill outreach requirements of the MS4 Permit.



Example of Student Created Mailer sent in Water Bill 2026

Flooding

Two major storms in the last 50 years (1992 Nor'easter and 2012 Sandy) made apparent the vulnerabilities of living along the Raritan Bay in a 1 square mile area town surrounded by water. Creeks define 2 borders of Keyport; the Chingarora on the East, the Matawan on the West while Raritan Bay is the North boundary. A 3rd major creek the Luppatatong is located close to the western border and empties into the bay. Keyport is on the downstream confluence of the watershed basins.

Daily tide changes or abnormally high tides accompanied by wind and rain events can cause flooding and wave action in areas nearest to where creek and bay waters meet or where the creeks are narrow or shallow due to bank erosion and silt. High tides or major rains on their own will often result in flooding especially in the Beer Street basin, along parts of the American Legion Drive, Division Street, Third Street, and Green Grove Road. Antidotal evidence suggests these flooding events are becoming more frequent.

Flooding is not only more frequent but is often brought on by lesser amounts of precipitation and tide changes. It can be that these changes are brought about by bank erosion and silting due to snags, development in our own or other upstream municipalities or expansion of major roadways (Garden State Parkway). It is also possible it could be due to climate change, beach erosion and sea level rise. How much each contributes to the flooding changes is unknown.

The Rutgers Impervious Cover Assessment Report mentioned in the Storm Water Management section above does not map all the impervious surface in Keyport. However, in its Impervious Reduction Action Plan, Rutgers proposed actions to either repave large impervious nonresidential parking lots with pervious surfaces and use bioretention systems – rain gardens. In comparing the FEMA flood insurance rate maps and the thirteen sites in the Rutgers Reduction Plan no sites are in a special flood hazard area (SFHA) but of course are connected to outfall pipes emptying eventually into the bay.

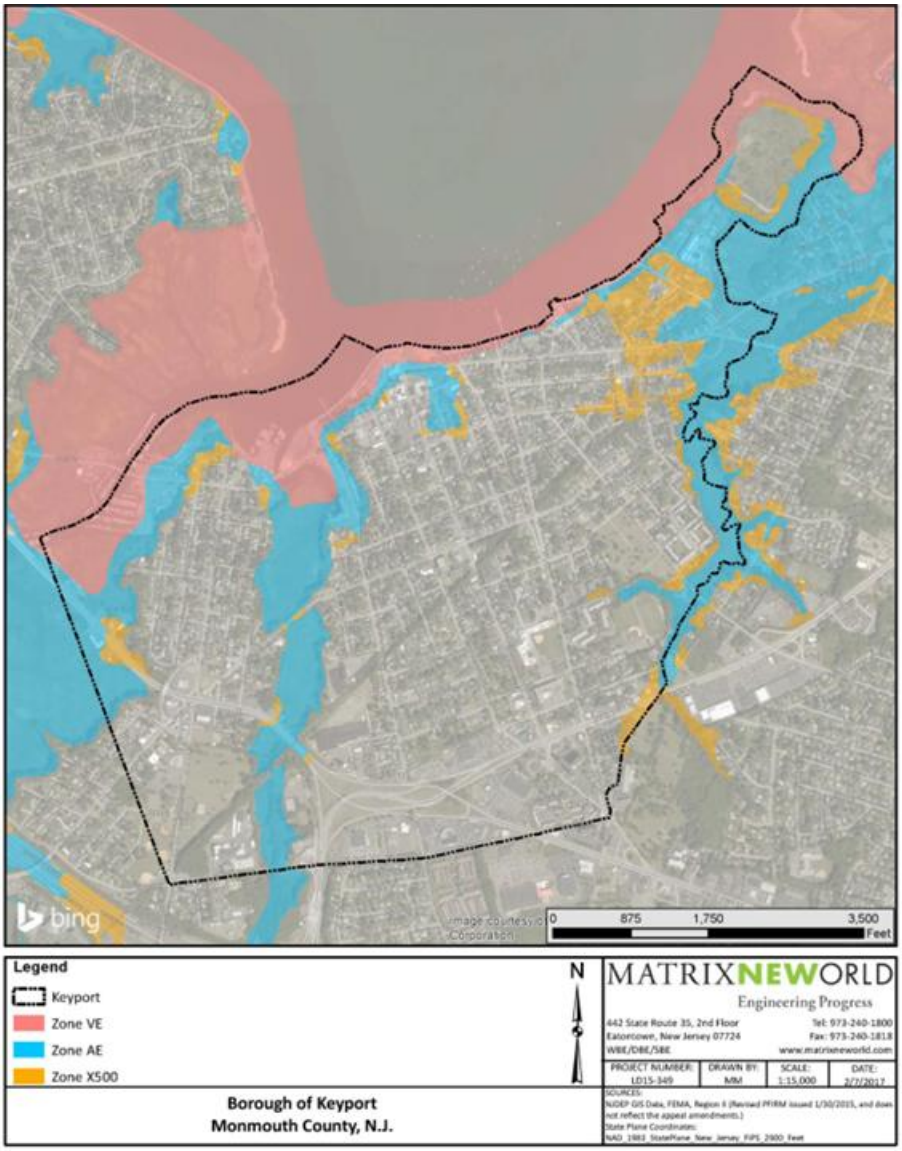
There is no indication that any flood prone areas disproportionately impact low income or communities of color.

After the 1992 Nor'easter and Sandy in 2012 major actions were taken to protect against flooding and for disaster preparedness and recovery. The Keyport Waterfront Park bulkhead was raised up and rebuilt; the American Legion Drive (Ring Road) was relocated from its original position along the bulkhead to the southern edge of the park along the rear sides of the commercial buildings on Front Street. The park created a large area of pervious surface and a rain garden disconnecting the parking lot runoff from the bay and the bayfront walkway. This project was in the Brown Fields Redevelopment Area and done in part with NJ State funding. A future project to elevate Fireman's Park is a project in the funding stage and will serve in part to address flooding in Beers Street Basin. Boro Engineering has

addressed Division Street flood issues with the installation of a new outflow valve and has also done the same on Beers Street.

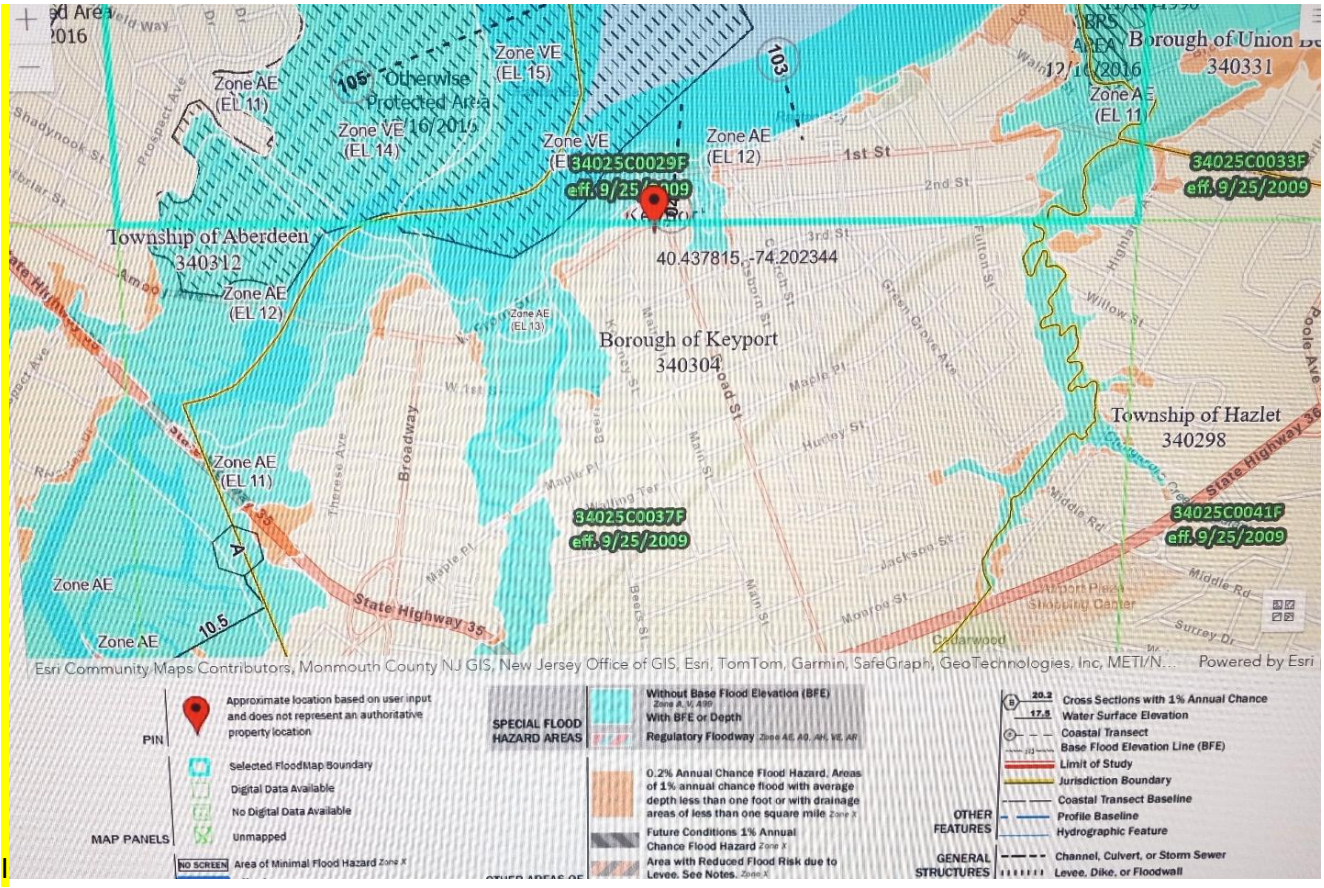
Most importantly. a Community Resilience Plan Element was added to the Master Plan "The Community Resilience Element identifies four Risks and Vulnerabilities facing Keyport. The Borough will need to address Resilience to Flood, Precipitation, Extreme Wind, and Climate Change". Keyport's Master Plan is on the Boro's website under the sub menus Government, Planning and Zoning, Master Plan Documents, **2017 Keyport Borough Master Plan.** The 2017 Master Plan's Community Resilience Plan Element provides much more information on the topic of flooding and is a must read for people interested in or concerned about flooding.

According to Keyport's Master Plan Community Resilience Plan Element "Over 26 percent of Keyport's land area is within the 100-year floodplain, also known as the Special Flood Hazard Area (SFHA). The map below illustrates the location and extent of currently mapped special flood hazard areas for Keyport based on FEMA's 2015 Preliminary Digital Flood Insurance Rate Maps (DFIRMs). This includes Zones A/AE (100- year floodplain; 1% annual flood chance), Zone VE (100-year coastal flood zones, associated with wave action), and Zone X500 (500-year floodplain; 0.2% annual chance). Approximately 37% of the population, or 2,794 persons, were deemed vulnerable to flooding, while 7,059 persons were deemed vulnerable to storm surge (93 percent) with varying probability based on the intensity of the storm." One recommendation was "Update the Flood Damage Prevention Ordinance to require an elevation of BFE plus 3 feet for mechanical equipment and the lowest floor joist of a new building or required rebuild (based on the 55% damage due to flooding criteria) that is located in SFHA VE and AE zones to deal with sea-level rise over the life of the building." See the FEMA Map below.



Recently New Jersey introduced a set of regulations known as NJ **PACT (New Jersey Protecting Against Climate Threats.** These regulations were adopted in January 2026. NJPACT represents a massive overhaul of the state's environmental and land-use regulations designed to protect communities from climate change, rising sea levels, and worsening inland floods. The NJ PACT requirements are set out in the Resilient Environments and Landscapes (REAL) rules whose primary focus is updating flood hazard area standards. Key changes are Flood Elevation Standards, Flood-resistant Building Requirements, and Stormwater Management Upgrades. New Rules require setting the regulated flood elevation—known as the Climate-Adjusted Flood Elevation (CAFE) at **4 feet above**

FEMA's Base Flood Elevation (BFE) for new and substantially improved structures in coastal and tidal flood hazard areas (SHA). BFEs are shown in the FEMA map below:



The Boro, out of necessity, has responded to its flooding issues in numerous ways and is proactively pursuing solutions to threats inherent in climate change and associated sea level rise. Keyport Public Works, its engineer, volunteers and public, do their share in protecting the creek and bay waters from pollution and ensuring the stormwater system is functioning as designed.