

2022 STATE OF BUZZARDS BAY

**Pollution Reductions
Drive Improvements**

**Climate Change
Moving the Goal Post**

46

OUT OF 100

ON THE COVER

Sunlight streaming through clear water to reach lush eelgrass beds and their resident bay scallops. It's hard to imagine an image that better reflects a restored Buzzards Bay. Such a Bay is only possible with low pollution levels and healthy watershed forests, streams and wetlands.

*photo (cover and right):
Romona Robbins*

buzzards
BAY
COALITION

The Buzzards Bay Coalition is a membership-supported non-profit organization dedicated to the restoration, protection and sustainable use and enjoyment of Buzzards Bay and its watershed. Founded in 1987, the Coalition works to improve the health of the Bay ecosystem for all through education, conservation, research and advocacy.

Learn more at:

www.savebuzzardsbay.org

2022 STATE OF BUZZARDS BAY

POLLUTION

	2015	2022	
Nitrogen	53	57	↑
Bacteria	62	59	↓
Toxics	52	55	↑

WATERSHED HEALTH

	2015	2022	
Forests	77	76	↓
Streams	71	71	↔
Wetlands	60	59	↓

LIVING RESOURCES

	2015	2022	
Eelgrass	23	25	↑
Bay Scallops	2	2	↔
River Herring	2	1	↓

OVERALL SCORE (100 = Excellent)

45

46

↑ Improvement
↓ Decline
↔ No Significant Change

How We Create our Report

To create the State of the Bay report, the Buzzards Bay Coalition collaborates with scientists and land use experts to examine the best available current and historical indicators in three categories: Pollution, Watershed Health, and Living Resources. Beginning in 2003, we have returned every few years to assess these same indicators as a consistent method for tracking progress or degradation over time.

The current State of the Bay is measured against the healthiest Buzzards Bay in recorded history — the natural abundance experienced by explorer Bartholomew Gosnold and his crew in 1602. The Bay that Gosnold experienced was largely unspoiled by harmful human activities and rates 100 on our scale. Today, a restored, healthy Buzzards Bay would likely score a 75.

In examining the best available information for each of the indicators, we actively seek additional data and more accurate sources of information to improve on this report on each iteration. The most reliable and consistent source of information is that collected through the Coalition's own baywide Water Quality Monitoring Program, now in its 31st consecutive year. That data, collected in partnership with the Marine Biological Laboratory's Ecosystems Center in Woods Hole, serves as the foundation of the Nitrogen Score.

Originally planned as a 2020 report, the Covid-19

Pandemic delayed some important data sets upon which this report relies. NOAA and EPA mussel tissue data used to calculate the Toxic Score was delayed, but was ultimately acquired in 2022. The worst data loss came from the MA Department of Environmental Protection which has failed to update its analysis of wetlands loss for nine years now. That data had been expected in 2020, but was postponed during Covid and has yet to be released.

We are grateful to all who contributed to this report. Joe Costa, Executive Director of the Buzzards Bay National Estuary Program helped with the Bacteria and Eelgrass scores this year. Paul Lefebvre, GIS Specialist at the Woodwell Climate Research Center, developed the Forest and Stream Buffer score. Chris Neill, Senior Scientist at the Woodwell Climate Research Center and Chair of the Coalition's Science Advisory Committee, provided invaluable guidance and support. In addition, several agencies provided data for this report including the Massachusetts Division of Marine Fisheries, Massachusetts Department of Environmental Protection, US Environmental Protection Agency, National Oceanic and Atmospheric Administration, and Alewives Anonymous. John Rogan of Clark University's Human-Environment Regional Observatory provided data on areas of forest cleared for solar development.

The Chesapeake Bay Foundation's annual State of the Bay report serves as a model for our report.

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THE BOTTOM LINE

Improved 2022 State of Buzzards Bay score reflects significant reductions in nitrogen and toxic pollution, as well as new challenges facing the Bay due to climate change.

Since the beginning of our State of the Bay reports in 2003, we have documented troubling trends in the health of Buzzards Bay. That year's assessment yielded a score of 48 out of 100. Since then, the score has been stalled at 45 for the last three reports. In all those cases, the story behind that flat line remained the same: slow improvements in things like toxics and bacteria pollution were being eliminated by the impact of expanding nitrogen pollution.

But then in 2015, nitrogen pollution stopped getting worse, and we stopped losing eelgrass beds as well. We hoped that this encouraging pause was signaling that we may have reached the floor on nitrogen pollution getting worse in the Bay.



Pollution Reductions Are Driving Improvements ...

Six years on, the data on nitrogen pollution is even better than expected with the state of pollution in 2018 recovering to levels not seen since 1995 (before declining slightly in the next three years). This is not just great news for improved water clarity and healthy oxygen levels. The conditions created by reduced nitrogen pollution can also be seen in expansion of eelgrass beds throughout the Bay and even a bay scallop harvest in 2018-18 on a scale not seen in more than a decade.

No other form of pollution does more harm to Buzzards Bay and all its harbors and coves than nitrogen, and its 4-point improvement in this State of the Bay should be celebrated. It is the result of years of local efforts to clean up septic systems and old sewer plants as well as state and federal gains in reducing the amount of nitrogen that falls on the Bay from air pollution.

The other pollution reduction to be celebrated is the continued decline of toxics in the Bay. A 3-point improvement in the amount of toxins detected in the Bay's delicate blue mussel populations is a result of the ongoing cleanup of legacy industrial pollution and modern restrictions on the use of toxics in agricultural, industrial and home products.

... but Climate Change is Moving the Goal Post.

Just when it looks like we're beginning to address nitrogen pollution — the driving factor behind Bay declines over the past 30 years — **climate change is moving the goal post and changing the Bay restoration landscape.** Two factors that were not even recognized in the data when we started these assessments in 2003 are taking over as the greatest drivers of Bay decline — warmer water and rising sea levels.

Warmer water in the Bay — up 4 degrees Fahrenheit since the mid 1990s — now allows bacteria to persist longer leading to shellfish bed and beach closures, and extends the season of biological activity in the Bay encouraging algae to bloom on lower levels of nitrogen. In effect, we need to remove more nitrogen in a warmer Bay to see the same water quality improvements.

And rising sea levels are proving to be the Achilles heel of the Bay's vital salt marshes, which are eroding and drowning under higher tides and higher base sea level. This is the most disappointing new challenge identified in these data.

A final point. As a regional assessment, the State of Buzzards Bay scores can mask local variations in the data. Not all corners of the Bay improved and others, like the Westport River, saw exceptional gains.

POLLUTION

Nitrogen

2022 SCORE: **57**

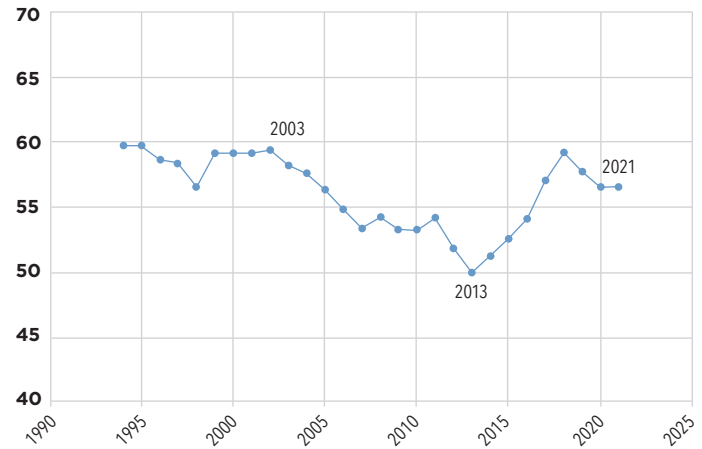
▲ (+4 from 2015)

No source of pollution has done more to damage the health of Buzzards Bay's harbors, coves and tidal rivers over the past 40 years than nitrogen pollution. Between 1992 and 2013, nitrogen entering the Bay primarily from residential septic systems, but also from older wastewater treatment plants, air pollution from cars and power plants, and fertilizers, resulted in decreasing Bay Health scores documented by the Coalition's Baywatchers Water Quality Monitoring Program. The downward trend pointed to a bleak future for our region's coastal waters. And then, the decline slowed and there was enough optimism to label the status as an encouraging pause in nitrogen pollution in our 2015 State of the Bay report.

The past six years have seen that 'encouraging pause' converted to a dramatic rally. In 2021, the baywide Nitrogen Score has made a 4-point improvement — the largest change in any of the State of the Bay indicators. Across the Bay, Nitrogen levels are down and water clarity and sunlight penetration are improved. Closely-related Eelgrass and Bay Scallop populations (discussed later in this report) have also benefitted.

The score of 57 is based on the 5-year running average Bay Health Index scores across 180 locations from the Westport Rivers to Woods Hole representing the Bay's major harbors, coves and tidal rivers. Between 2013 and 2018 there was a steady increase in water quality that then leveled over the last three years. As with any regional average, it is important to note that there are variations between embayments. Some places are doing worse, but many more are doing better.

BAY-WIDE NITROGEN SCORE



Towns across the Bay are taking steps to reduce nitrogen pollution, and those actions are working to reverse the Bay's decline. Since our last report, wastewater treatment plant upgrades in Marion and West Falmouth have been implemented, towns are doing more to require that new developments utilize the best nitrogen-removal technologies for septic systems, and cranberry farmers continue to improve bog construction methods and practices that reduce fertilizer losses. We have also benefitted from federal clean air policies which have dramatically reduced the amount of nitrogen compounds (i.e., nitrous oxides and ammonia) falling on the Bay from car exhaust pipes and old fossil fuel power plants (see graph). The last coal-fired power plant in Massachusetts located at Brayton Point in Somerset, just 5 miles from the western edge of the Buzzard Bay watershed, was shut down in 2017 ending more than 50 years of pollution entering the Bay.

How is Nitrogen Affecting Your Local Harbor or Cove?

Bay Health Index (5-yr running average)

Degraded

Location	2015	2021
Masketucket River Estuary	10	3
Acushnet River Estuary	17	17
Stuyg Harbor, West Falmouth	25	25
Inner Slocums River	24	27
Westport River	19	28
Apawam River, Upper East Branch	41	28
Inner Weweantic River	28	29
Mattapoisett River Mouth	34	29
Inner Apponagansett Bay	32	31
Westport River	30	34
Rands Harbor	39	34
Eel Pond, Inner East Branch	25	35
Outer Mattapoisett	45	36
Eel Little River	26	39
West End Pond, Bourne	38	40
Hammett Cove	42	40
Outer Weweantic	43	40
Inner Weweantic River	33	41
Wild Harbor, Bedford Harbor	45	42
Broad Marsh River	45	42
Back River	45	42
Inner Pocasset	41	43
Pocasset Harbor	49	48
Inner Wareham	37	48
West Falmouth River	62	50
Little Sippewissett Harbor, Head	52	50
Apponagansett Marsh	53	51
Inner Sippewissett Bay, Mid-Harbor	37	51
Outer Slocums River	44	53
	48	53
	51	53
	48	55

Today, by far the largest source of nitrogen to most Buzzards Bay harbors and coves remains residential septic systems. Even new, properly functioning Title 5 septic systems do little to prevent nitrogen pollution. Much work lies ahead to connect more homes to modern wastewater treatment plants, and where that's not possible, to enhanced nitrogen-reducing septic systems.

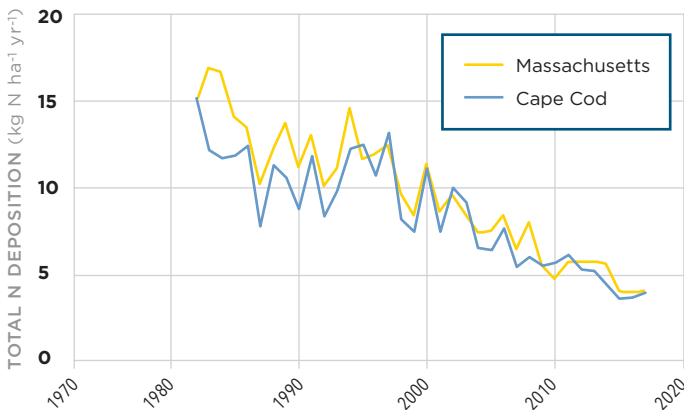
The nitrogen data also contain a warning for the future. Chlorophyll concentrations (a measure of algae in the water) in the Bay were the highest ever recorded between 2005 and 2013 and while somewhat lower since 2014, they are generally still higher than the first ten years of the Baywatchers Program. This observation is a reason for concern. The steady decrease in nitrogen concentrations shows clearly that we can make a

difference. The trend in chlorophyll concentrations, however, indicates that while water quality responded to decreases in nitrogen, chlorophyll concentrations have remained higher than they were at similar nitrogen concentrations 20 years ago, which shows the challenge that climate change poses.

Higher bay water temperatures help to fuel algal blooms and keep dissolved oxygen concentrations lower, so nitrogen concentrations will need to keep declining if we are to restore water quality. In essence, climate change is moving the goal post on Bay recovery.

In a world of warmer water, more nitrogen pollution must be removed from the Bay to get the related positive responses in lower algae (clearer water) and greater oxygen (more fish and shellfish) than before.

DECLINES IN NITROGEN IN AIR POLLUTION



There is an up to 10-year lag between reductions in emissions from the source and improved water quality in nearby waterways. Adapted from Lloret et al. 2022 (doi.org/10.1016/j.ecss.2022.108057)



Outer New Bedford Harbor	50	56
Little Bay, Fairhaven	69	56
Inner Wild Harbor	46	57
Hen Cove	51	57
Outer Apponagansett Bay	57	57
Squeteague Harbor	57	58
Outer Wareham River	47	59
Little Buttermilk Bay	60	60
Fiddlers Cove	57	61
Inner Red Brook Harbor	61	61
Shell Point Bay, Onset	43	63
Marks Cove	58	63
West Falmouth Harbor, Mid-Harbor	64	63
Inner Mattapoissett Harbor	61	65
Outer Clarks Cove	63	66
Westport Harbor	43	67
Buttermilk Cove	64	67
Phinnegys Harbor	51	68
East River, Onset	56	69
Blankenship Cove	62	69
Outer West Falmouth Harbor	66	69
Inner Onset Bay	67	72
Outer Red Brook Harbor	70	72
Nasketucket Bay	64	74
Aucoot Cove, Mid-Harbor	70	75
Outer Mattapoissett Harbor	56	76
Hilliers Cove	77	76
Westport River Inlet	74	76
Megansett Harbor	75	77
Outer Onset Bay	80	81
Cuttyhunk Cove	64	82
Inner Quissett Harbor	72	83
Penikese Island	76	83
Outer Quissett Harbor	77	84
	81	86
	80	89
	96	90
	86	91

Healthy

Bacteria

2022 SCORE: **59**

↓ (-3 from 2015)

Since the early-1990s, communities around the Bay have worked hard to improve sewage treatment, identify illegal septic hookups, and tie more homes into municipal wastewater plants. As a result, today our swimming beaches are much safer, and more shellfish beds are open to harvest. But the work is far from complete – and becoming more challenging.

A 3-point drop in the Bacteria score is the largest ever reported and marks a troubling new challenge facing all corners of the Bay. A near steady source of improvement between 1990 and 2010, the trend of reopening shellfish beds has reversed over the past four years.

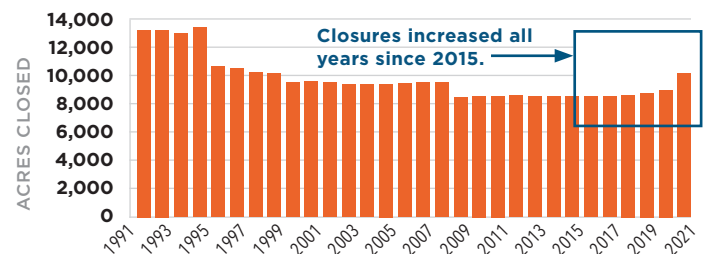
Our bacteria score is calculated by tracking the number of acres of shellfish beds closed to harvest on July 1st of every year. Between 2015 and 2021, the number of acres open on that day has declined by 1,656 acres.

Most notable is that this drop in score does not appear to be due to actual increases in the discharge of bacterial contamination. The decline in score is partially due to more stringent federal regulation that now requires closing more shellfish beds around marinas and

mooring fields as a precaution. This change accounts for 56% of the increased closures. A second reason is more of a concern. The combination of continued nitrogen pollution now exacerbated by ever warmer water in the Bay helps bacteria persist longer than before. We see the same effect at play in what are now more frequent late summer beach closures when the Bay is at its warmest.

This is another case of climate change moving the goalpost. Greater reductions of pollution are now required to produce water quality benefits.

BUZZARDS BAY SHELLFISH CLOSURES, JULY 1



Toxics

2022 SCORE: **55**

↑ (+3 from 2015)

The reduction of toxic pollution continues to be one of the brightest spots in this year's State of Buzzards Bay report thanks to stricter laws, improving farming and industrial technologies, and better enforcement.

Sources of toxic pollution to Buzzards Bay include oil spills, discharges from wastewater treatment plants, household hazardous wastes, pesticides, and stormwater runoff. In addition, “legacy” contaminants – pollution from past practices like the dumping of PCBs in New Bedford Harbor from 1950-1980 – continue to demand cleanup attention and funding.

To assess the extent of toxic pollution in the Bay, we use data collected from blue mussels which easily absorb and bioaccumulate toxics and reflect the quality of the waters surrounding them. Our score is based on a combination of monitoring of PCBs in mussels in New Bedford Harbor by the US EPA (25%) and the NOAA Mussel Watch Program's monitoring of 42 different

contaminants (10 metals, 16 PAHs, 16 organochlorine pesticides) at locations throughout Buzzards Bay (75%).

In this year's assessment, the New Bedford Harbor PCB portion of the score improved, but the increase was not as large as it was between either of the two previous reports in 2011 and 2015. The most recent data available from EPA, however, was from 2018, and removal of contaminated sediments in the Harbor has accelerated due to federal Covid recovery funding in recent years.

The level of toxic pollution elsewhere in Buzzards Bay remains much lower. 2021 Mussel Watch data were analyzed from sampling stations at the Cape Cod Canal, off West Falmouth, and at Gooseberry Island in Westport. Levels of pollution in the metals class remained the same over our 2015 report, but reductions in the levels of PAHs (from burning of coal, oil and gasoline) and organochlorine pesticides (historically used in agriculture) drove the improvements.

WATERSHED HEALTH

Forests

2022 SCORE:

76

↓ (-1 from 2015)

Compared to other East Coast estuaries like Narragansett Bay (42% forested), Long Island Sound (56%) and the Chesapeake (60%), Buzzards Bay has an important distinction: its large area of watershed forest. The simple fact that 76% of our watershed remains forested is one of the key secrets behind the Bay's relative good health.

The 2022 forest score of 76 represents a decline of one point over 2015. A disappointing 1,863 acres of forest were lost to development since our last report. Land Use analysts at the Woodwell Climate Research Center utilized aerial imagery to determine the extent of forest in our region at an extremely high level of resolution.

Forests protect clean water in our bay, streams, ponds and drinking water supplies in countless ways. The soils in forests capture rainfall, filtering out harmful pollution before slowly releasing the water into streams,

wetlands and groundwater. Tree roots hold soil in place preventing erosion and sediment pollution. And, forests store carbon, keep our air clean and cooler, and shade coldwater streams where native brook trout and other wildlife thrive.

Of the 1,863 acres of forest lost to development since 2014, two-thirds of the loss was attributed to largely low density, sprawl residential development fueled by the hottest real estate market in a decade. The other one-third – 604 acres – was destroyed by a frustrating new practice in our watershed – the clearing of mature forest for solar farms. The production of renewable energy from solar photovoltaics is an important part of decreasing dependence on fossil fuels and fighting climate change. But clearing Bay-saving forests is not the way forward when our region is full of alternative, already altered sites.

Stream Buffers

2022 SCORE:

71

↔ no change

No part of our landscape contributes more to protecting clean water than Stream Buffers - the forested areas that grow along the more than 700 miles of streams flowing through the Buzzards Bay watershed. The first 200 feet of trees and plants along either side of a stream are the most important to protect due to their ability to capture, absorb and remove an amazing amount of pollution before it ever reaches our waterways.

The Stream Buffer score remains steady at 71, meaning that local Conservation Commissions in all Bay towns continue to hold their own to prevent development within 200 feet of the Bay's small streams. Between 2014-2021, just 52 acres of natural cover was lost in this critical band throughout the Bay watershed.

42% of the loss (22 acres) of Stream Buffer over that period was due to solar development.

As housing developments, farms and commercial buildings have replaced natural stream buffers, the health of our water has suffered. Between 1620-1995, 29% of Buzzards Bay's watershed stream buffers – nearly 9,000 acres – were lost to poorly planned development.

The relative success in maintaining our Stream Buffer area over the past 25 years can be largely attributed to the MA Rivers Protection Act – a targeted amendment to the state Wetlands Act. Under the law, the first 100 feet along streams are usually protected, the second 100 feet require permitting but can continue to face development pressure. Local Conservation Commissions in all Bay towns administer this law on a project-by-project basis.

No component of the Bay ecosystem assessed by this report is under more pressure and accelerating decline than the Bay's wetlands.

Overall, an estimated 40% of the Bay's original wetlands have been filled, drained, or built upon since European settlement. These rich habitats are powerful pollution filters that can absorb as much as 90% of the nitrogen flowing across the landscape from nearby development. They are, in effect, the Bay's kidneys – and we can't afford to lose any more of them.

Layers of local, state, and federal laws overlap to protect the Bay watershed's salt marshes, wooded swamps, and freshwater wetlands. Nevertheless, between 1997-2012 we lost 265 acres of wetlands at an average annual rate of 10-14 acres since 2001. The MA DEP issued an analysis of wetland destruction every 3-4 years during that time, but has failed to produce a new analysis for the past nine years. Carrying forward that previous loss rate, it's possible that an additional 90-125 acres of wetlands were lost due to traditional land development in that period.

The most serious and troubling losses of wetlands today, however, no longer come from bulldozers and backhoes. A new silent form of human destruction is taking our most precious wetlands – our salt marshes – away from us. Climate change-driven sea level rise is literally drowning salt marshes in place and already at an alarming rate. These factors produced the first 1-point drop in the Wetlands score in the assessment's history.

Of the Bay's nearly 5,000 acres of saltmarsh, approximately 7% of them – were lost between 2001 and 2019. This new data are not a projection, but rather the real-world findings at twelve study sites – from Westport to Falmouth – featuring a wide range of marsh configurations. Some marshes studied, like those on Mattapoisett Neck, saw dramatic losses of 23% of their area.

The terrible driver here is accelerating sea level rise and it will only get worse in the decades ahead. The official Massachusetts Coastal Flood Risk Model projects that sea-level in the Bay will increase by 1.27 feet over 2008 levels by 2030; 2.57 feet by 2050; and nearly 8 feet by 2100. Under these water levels, analysis contained in the 2022 State of the Coast report by The Trustees of Reservations projects that by 2050 Westport will lose 48% of its salt marshes (including all its island marshes), Dartmouth 30%, Bourne 28%, Marion 21%, and Mattapoisett and Falmouth 17% each.

Scientists and natural resource managers across southern New England are scrambling right now to identify stop-gap measures that can be deployed to slow the rate of salt marsh loss and to preserve immediately adjacent coastal areas where marshes may migrate inland as the sea rises. These efforts are vital, but not as important as halting the world's reliance on fossil fuels which continues to destroy the Bay ecosystem.



LIVING RESOURCES

Eelgrass

2022 SCORE:

25

↑ (+2 from 2015)

If you want to track the spread of nitrogen pollution in your own corner of Buzzards Bay, watch the eelgrass. This rooted, underwater plant grows in meadows along the bottom of the Bay's harbors, coves and tidal rivers in areas with clear water.

But when nitrogen pollution increases, it fuels the growth of algae that reduces water clarity. Without enough sunlight reaching the bottom, eelgrass dies – just like a shaded house plant. And those species that depend on eelgrass – juvenile fish, blue crabs, and bay scallops – begin to vanish too. But when water quality improves, eelgrass has consistently shown its ability to naturally recover.

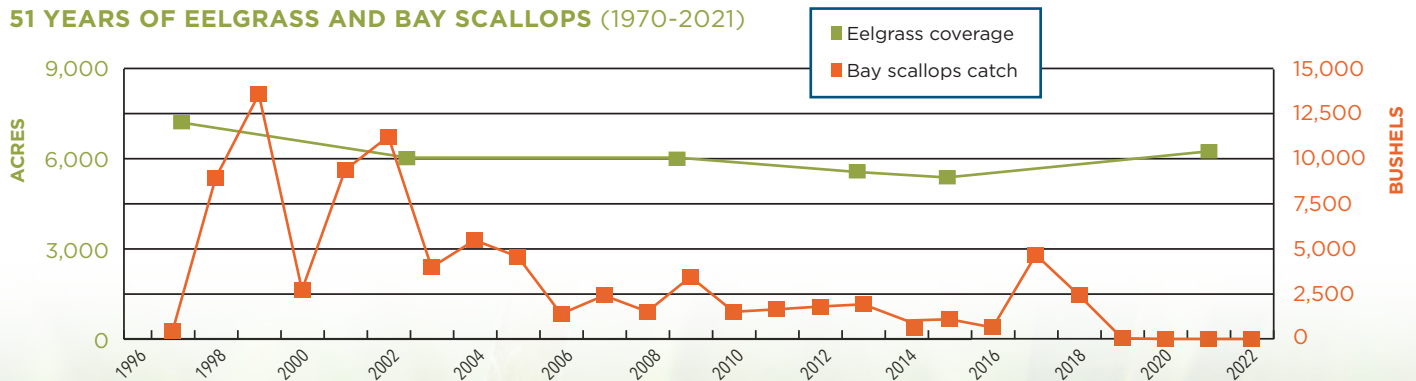
Like the 2021 Nitrogen Pollution score, eelgrass coverage increased by 2 points in the past six years. Overall, eelgrass meadows in Buzzards Bay increased

552 acres between 2015 and 2021. The change was documented through analysis by the Buzzards Bay National Estuary Program of maps of eelgrass created from aerial images and field confirmation by MassDEP.

There are a few areas that stand-out in this eelgrass recovery story. Most notable, more than half of all new eelgrass acres resulted from a dramatic expansion in the Westport Rivers, particularly in the West Branch which added 201 acres. And, a fifth of new eelgrass since 2015 occurred along the coast just outside of embayments where depths remain shallow, but water quality benefits more from open exchange with the cleaner open bay.

The area of greatest eelgrass decline was in Mattapoisett Harbor which has lost 51 acres since 2015.

51 YEARS OF EELGRASS AND BAY SCALLOPS (1970-2021)

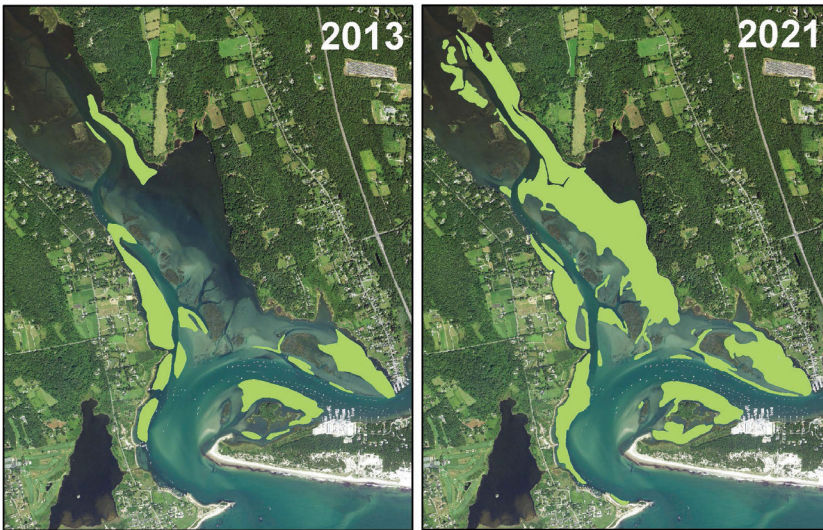


Bay scallops were to Buzzards Bay what oysters historically were to New York Harbor and the Chesapeake. But today, our once-abundant and highly-valuable bay scallops have all but disappeared from most parts of Buzzards Bay.

The Bay Scallop score was unchanged from 2015 and 2021. The Massachusetts Division of Marine Fisheries reported an average catch of roughly 1,300 bushels per year. That’s a stunning decline from 1985, when nearly 70,000 bushels were harvested in Buzzards Bay. But the story behind these deliciously fickle shellfish over the past six years holds a glimmer of hope.

As the graph on previous page shows, bay scallops are notorious for their natural boom and bust cycle, with banner harvest years followed by years of almost no catch. As populations have crashed over the past 35 years, harvests have remained consistently low. That was, until 2017 when 4,675 bushels were landed, followed by 2,430 bushels in 2018. Those harvests coincide with eelgrass recovery over the same time period as these two species are closely linked. Bay scallops live and grow among the shelter of eelgrass meadows and are dependent on them for their survival.

Despite that brief flash of promise, State shellfish catch records for 2020 and 2021 ominously show zero landings of bay scallops for the first time ever for Buzzards Bay.



Eelgrass recovery in the West Branch of the Westport River

Something good happened in the West Branch... again.

Between 2015 and 2021, 305 acres, or 55% of all new eelgrass growth in Buzzards Bay, came from the Westport Rivers, particularly the West Branch which accounted for 201 of those acres.

This rapid expansion of eelgrass meadow correlates with the 2017-19 bay scallop harvests – the best in 18 years. In fact, the MA Division of Marine Fisheries reports that 95% of all bay scallop catch in Buzzards Bay for those years was out of Westport.

And it’s not the first time that an unexpected boom year came out of the West Branch or Westport carried regional bay scallop landings.

The last large bay scallop harvest in the Bay was in 1985 when 66,169 bushels were landed. That harvest followed a similar rapid expansion of eelgrass in the West Branch. A 1988 scientific paper reported, “The cause of this recent recolonization (in the West Branch) is unclear, and this estuary has undergone sizable fluctuations in eelgrass abundance in the past. These new beds accounted for at least a 30% increase in eelgrass cover in this estuary over one year... Two years after the 1984 eelgrass expansion scallop catches were the best in many years.”

(From Costa 1988)

River herring in Buzzards Bay remain in a state of profound collapse with serious consequences for the Bay ecosystem.

Today, only a tiny fraction of the historic numbers of River Herring still make the journey from offshore, into the Bay, and upstream to spawn in the watershed's freshwater rivers and ponds. This is very bad news for the Bay's sportfish such as Striped Bass and Bluefish that rely on herring as well as for many bird species including the region's endangered Roseate Terns. River herring, as a "foundation fish" at the base the food chain, provide an important pillar in the Bay ecosystem. And today that pillar remains in desperate need of rebuilding.

The historic decline of Buzzards Bay's anadromous fish like river herring can be traced first to the damming of the Bay's rivers, which prevent fish from swimming upstream, but also to water quality degradation, alterations to pond and stream flows, and offshore bi-catch by commercial menhaden, mackerel and Atlantic herring fishermen. A likely increasing challenge in years ahead are the extreme drought years that we are now experiencing due to climate change. Low water levels caused many Bay streams to run dry in late summer 2022 just as juvenile herring born upstream are making their transition to saltwater.

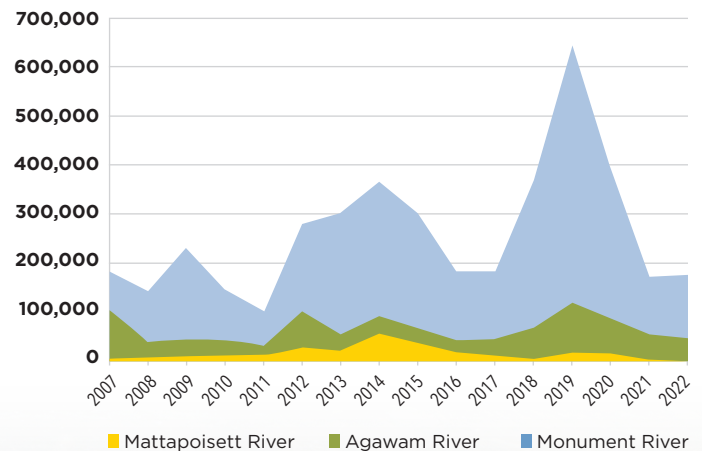
With one of the longest datasets available, the Mattapoissett River has served as our regional benchmark for tracking the state of river herring throughout Buzzards Bay. In 1921, state biologists estimated the river's run at 1.85 Million fish.

One Hundred years later, that figure sits at 1,886 fish – the lowest annual count ever recorded.

To put a finer point on these figures, fish in the Mattapoissett are 0.001% of the count made exactly a century ago.

But there are signs that count trends on the Mattapoissett may not be tracking the modest recovery being seen on other Buzzards Bay rivers such as the Monument (Cape Cod Canal) and Agawam River (see graph). Nearby on the Taunton River and Cape Cod there are also strong glimmers of hope. On the Herring River in Harwich, Selectmen this year voted to lift the 18-year moratorium on herring catch after seeing a remarkable 1.2 Million fish counted there in 2019 – restored to a third of its historic run size. This action followed a similar step taken in 2016 in Middleboro on the Nemasket River – the largest run in the state – following a number of high-count years.

COUNTS ON THE BAY'S LARGEST HERRING RIVERS (2007-2022)



Taking Action to Improve the State of Buzzards Bay

Cleanup Wastewater

Nitrogen and bacteria pollution are both rooted in inadequate residential wastewater treatment. Nearly 2/3 of homes around the Bay are served by septic systems which are not designed to remove nitrogen pollution. It is the pollution from these homes – from us and our neighbors – at the root of the Bay’s problems.

What Can Be Done:

- Connect existing and new homes to central Wastewater Treatment Plants (WWTP). Modern WWTPs consistently remove >90% of nitrogen pollution and represent the best solution available to our communities.
- Where central sewer systems are not possible, such as in lower-density suburban and rural areas, upgrade homes to individual Denitrifying Septic Systems which remove >50% of nitrogen.
- Wastewater infrastructure is expensive. Support your town officials in long-term financial planning and advocate for grant funding from state and federal agencies.

Preserve Forests and Wetlands

Preservation of the Bay watershed’s most important forests, stream corridors and wetlands is the most cost effective way to protect the health of Buzzards Bay as well as our drinking water. These are the Bay’s natural filter systems and they demand active effort to protect them in the face of land development pressures.

What Can Be Done:

- Support your town’s active participation in and funding of open space preservation.
- Town Conservation Commissions and the MA DEP must enforce existing wetlands and river protection laws. DEP’s release of updated Wetlands Loss analysis is critical to tracking compliance.
- State laws and local zoning should be amended to redirect solar developments away from forests to already disturbed and built areas.

Address Climate Change

So much of what needs to happen to restore the Bay is controlled locally. Wastewater and land use decisions happen each week at our own Town Halls. While that is not the case with curbing Climate Change, we all must do our part to prevent the warming and sea level rise that is exacerbating nitrogen and bacteria pollution in the Bay, devastating our vital salt marshes and altering flows in our streams. We all must accelerate our community’s transition away from the burning of fossil fuels and support clean, renewable energy development.

A few things everyone can do right now:

- Get involved in town government: Volunteer to serve on Select, Planning, Conservation and Health boards, vote at Town Meeting, comment on projects that affect the local environment.
- If a sewer connection is not possible in your area, plan for the upgrade of your own home septic system to one that removes nitrogen.
- Reduce your use of lawn fertilizers and only use organic garden products.
- Never dump paint, oil, cleaners or other hazardous waste down sinks or storm drains.
- If you own undeveloped land, talk with the Buzzards Bay Coalition or a local land trust about conservation options.
- Avoid eelgrass beds and sensitive salt marsh edges when boating and shellfishing.



MAIN OFFICE

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Join us and get involved at
www.savebuzzardsbay.org