Safe for Swimming 2021 Edition

Pollution at our beaches and how to prevent it

ENVIRONMENT NEW HAMPSHIRE
RESEARCH & POLICY CENTER

FRONTIER GROUP

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Executive summary

The Clean Water Act, adopted in 1972, set the goal of making all of our waterways safe for swimming. Nearly a half-century later, Americans visiting their favorite beach are still met all too often by advisories warning that the water is unsafe for swimming. And each year, millions of Americans are sickened by swimming in contaminated water.

An analysis of fecal indicator bacteria sampling data from beaches in 29 coastal and Great Lakes states and Puerto Rico reveals that **328 beaches – more than one of every 10 beaches surveyed – were potentially unsafe on at least 25% of the days that sampling took place in 2020.**[1] More than half of all the 3,166 beaches reviewed were potentially unsafe for swimming on at least one day. Beaches were considered potentially unsafe if fecal indicator bacteria levels exceeded the U.S. Environmental Protection Agency's "Beach Action Value" associated with an estimated illness rate of 32 out of every 1,000 swimmers.[2]

To protect our health at the beach, policymakers should undertake efforts to prevent fecal pollution, including deploying natural and green infrastructure to absorb stormwater.

Fecal contamination makes beaches unsafe for swimming. Human contact with contaminated water can result in gastrointestinal illness as well as respiratory disease, ear and eye infection, and skin rash.[3] Each year in the U.S., people contract an estimated 57 million cases of recreational waterborne illness from swimming in oceans, lakes, rivers and ponds.[4]

Our beaches are at risk. Runoff from paved surfaces, overflows from aging sewage systems, and manure from industrial livestock operations all threaten the waters where Americans swim. These pollution threats are getting worse with climate change, as more extreme precipitation events bring heavy flows of stormwater.

- Sprawling development has created more impervious surfaces that cause runoff pollution and has destroyed natural areas like wetlands that protect beaches from contamination. From 1996 to 2016, U.S. coastal regions added 4.2 million acres of development, while losing 640,000 acres of wetland and nearly 10 million of acres of forest.[5]
- America's sewage infrastructure is deteriorating and outdated. Many communities, particularly around the Great Lakes, still use combined sewers that were designed to discharge sewage directly to waterways during heavy rainfall. Sanitary sewers, which are designed to carry sewage alone, can also spill dangerous sewage if they are not properly maintained, and overflow as many as 75,000 times each year in the U.S.[6]
- The rise of factory farms has resulted in large concentrations of livestock manure that cannot be stored safely and is often overapplied to crops. All too often, rainfall washes excess manure from cropland into our waterways where it can put swimmers' health at risk. Animal manure can also contain pathogens that are resistant to antibiotics, creating added risk to public health.[7]

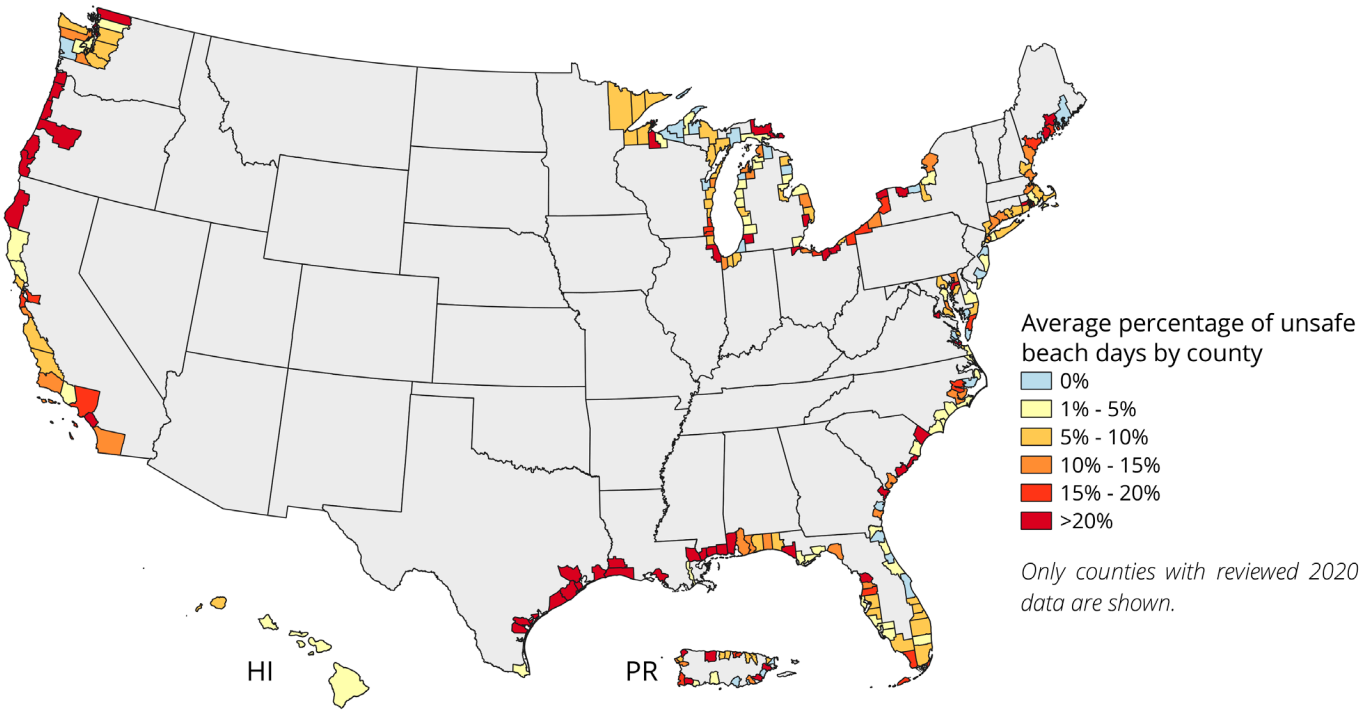


Figure ES-1. Average percentage of potentially unsafe beach days in 2020 by county
"Average percentage" represents the average of the percentage of potentially unsafe days at each beach within a county.

Of more than 3,000 beaches sampled for bacteria across the country in 2020, 328 were potentially unsafe for swimming on at least 25% of days that testing took place.

- As of May 2021, sampling data for 2020 from 3,166 beaches in 29 coastal and Great Lakes states and Puerto Rico was available through the National Water Quality Monitoring Council's Water Quality Portal.*
- Of those beaches, 1,689 (53%) had bacteria levels indicating potentially unsafe levels of fecal contamination for swimming on at least one day, and 328 were potentially unsafe on at least 25% of the days that sampling took place.
- Swimmers could also be at risk at additional beaches where no bacterial testing was conducted or available through the Water Quality Portal.

Bacteria testing of ocean and Great Lakes beaches in every region of the country revealed days of potentially unsafe fecal contamination in 2020.

- Among East Coast beaches, 837 beaches, or 47% of the 1,798 beaches tested, were potentially unsafe for at least one day in 2020. 113 beaches, 6% of those tested, were potentially unsafe on at least 25% of the days that testing took place.
- Among Great Lakes beaches, 297 beaches, or 60% of the 497 beaches tested, were potentially unsafe

* In the context of our findings, "beaches" in this report refer to recreational waters listed by the U.S. EPA under the Beaches Environmental Assessment and Coastal Health (BEACH) Act of 2000. Some "beaches" consist of multiple sampling sites. This represents a change from the 2019 (but not 2020) edition of this report, which assessed individual sampling sites. For this and other reasons, meaningful comparisons cannot be made between findings in this and previous reports. Testing data for city of Chicago beaches is from a local source, not the Water Quality Portal. See Methodology for details.

for at least one day in 2020. 59 beaches, 12% of those tested, were potentially unsafe on at least 25% of the days that testing took place.

- Among Gulf Coast beaches, 220 beaches, or 82% of the 268 beaches tested, were potentially unsafe for at least one day in 2020. 75 beaches, 28% of those tested, were potentially unsafe on at least 25% of the days that testing took place.
- Among West Coast beaches, 252 beaches, or 72% of the 351 beaches tested, were potentially unsafe for at least one day in 2020. 62 beaches, 18% of those tested, were potentially unsafe on at least 25% of the days that testing took place.

In every coastal and Great Lakes state and in Puerto Rico, sampling revealed potentially unsafe levels of contamination in 2020. (The figures below are based on U.S. EPA's Beach Action Value. Many states use other thresholds for beach closure and advisory decisions. Therefore, results presented in this report may differ from state reports on beach water quality. See Methodology for details.)

TABLE ES-1. EVERY STATE HAD BEACHES WITH POTENTIALLY UNSAFE DAYS IN 2020

State	Beaches tested in 2020	Beaches with at least one potentially unsafe day	Beaches with at least 25% potentially unsafe days
Alabama	24	21	8
California	258	193	42
Connecticut	65	46	11
Delaware	23	4	1
Florida	266	185	13
Georgia	26	17	3
Hawaii	218	55	14
Illinois	41	32	12
Indiana	21	18	1
Louisiana	23	21	10
Maine	61	36	15
Maryland	62	34	6
Massachusetts	556	264	29
Michigan	196	69	15
Minnesota	46	23	2
Mississippi	21	21	16
New Hampshire	16	9	3
New Jersey	210	34	2
New York	340	172	15
North Carolina	210	87	7
Ohio	54	49	14
Oregon	19	18	14
Pennsylvania	8	8	2
Puerto Rico	34	28	5
Rhode Island	65	30	13
South Carolina	23	20	7
Texas	61	55	31
Virginia	49	29	4
Washington	74	41	6
Wisconsin	96	70	7

To ensure that all of our beaches are safe for swimming, policymakers should work to protect beaches from runoff and sewage pollution – including by stopping pollution at its source, and by protecting natural areas. Solutions include:

- Dramatically increasing funding to fix sewage systems and prevent runoff pollution through natural and green infrastructure, including rain gardens, permeable pavement and green roofs.
- Protecting wetlands, which filter out pollutants like bacteria, and streams, which flow to coastal areas where people swim.
- Enacting moratoriums on new or expanded industrial-scale livestock operations, particularly in areas that threaten our beaches and other waterways.

Policymakers should also ensure that swimmers are presented with the best-possible information to make decisions regarding their health. Officials should expand funding for beach testing, to ensure adequate testing at all beaches. States should use EPA's most protective "Beach Action Value" bacteria standard for making beach advisory decisions and should work to implement same-day bacteria testing and warning systems.

Introduction

Americans love the beach. From the warm waters of the Gulf Coast to the cliffside beaches of the Pacific Northwest to the shores of the Great Lakes, America's beaches enrich our lives, providing us a place to escape everyday life, soak up the sun, and cool off in the hot summer months. In 2021, when many of us may still be reluctant to meet people indoors, the beach is an even more important getaway.

No matter where we live, we should be able to expect that the water at our beaches is clean and safe for swimming. In fact, that was a key goal when our nation adopted the Clean Water Act in 1972. But all too often, those arriving for a summer day at the beach are met by an advisory sign warning of unsafe water. Even worse, millions of Americans in recent years have been sickened by swimming in contaminated water, with many hospitalized.

As the following analysis shows, far too many beaches, in every coastal and Great Lakes state, can be unsafe for swimming.

The causes are often within our control. Reckless development destroys wetlands that filter pollutants; outdated sewer systems send raw waste directly into waterways; and agricultural practices create an excess of manure, which now often contains pathogens resistant to antibiotics, that finds its way into our waterways.

There are different culprits for beach pollution in different parts of the country. But every community can take action to both prevent pollution from being created in the first place, and to keep pollution from reaching the waters where our families go to swim. Doing so can protect public health and the environment, and help ensure that families across the country can look to the beach as a summer haven, now and in the future.

Fecal contamination of swimming areas poses a public health threat

People who swim in water polluted with sewage or other fecal contamination risk falling seriously ill.

Human contact with fecal contamination can result in gastrointestinal illness as well as respiratory disease, ear and eye infection, and skin rash.[8] The presence of fecal contamination in water is typically indicated by the existence of bacteria, including the *E. coli* and enterococcus bacteria samples reviewed in the following analysis. While bacterial indicators like *E. coli* can themselves pose health risks, most illnesses contracted from swimming in contaminated water are actually caused by other pathogens contained in fecal matter, including viruses.[9] Norovirus is likely the most common cause of viral recreational water outbreaks and can cause diarrhea, vomiting, nausea and stomach pain.[10]

Each year in the U.S., people contract an estimated 57 million cases of recreational waterborne illness from swimming in oceans, lakes, rivers and ponds.[11] The vast majority of those illnesses are unreported. Data on the most significant reported outbreaks is tracked by the Centers for Disease Control and Prevention (CDC). From 2000 to 2014, the CDC received 140 reports of outbreaks caused by recreational water contamination, including 45 outbreaks at beaches.[12] Those outbreaks caused 4,958 illnesses and two deaths.[13] In a single 2013 incident listed on the CDC's website, 141 people fell ill and 19 people were hospitalized from a contaminated Rhode Island pond (the pond was not named by the CDC).[14]

Water contamination can also ruin a day at the beach when it results in beach closures or swimming advisories. Of coastal beaches where water quality was tested in 2019, 40% had at least one advisory or closure.[15] While beach advisories are a critical tool to protect swimmers, many testing programs rely on a testing process that requires nearly 24 hours to show results, meaning that swimmers may have already been exposed to unsafe water by the time advisories are posted.[16]

Reckless development of our coasts, aging sewage systems and factory farms threaten America's beaches

The water at America's beaches frequently poses risks to human health (see "American beaches are often unsafe for swimming," page 14). Although some beach contamination results from natural sources such as wildlife, many of the most dangerous risks posed to swimmers are the result of human activity.

In recent decades, three trends in particular – the developing and paving of natural areas in coastal regions, the deterioration of sewer systems, and the rise of factory farms – have resulted in harm to our beaches. Climate change, which brings more wet weather and flooding, is exacerbating this harm. Without action to reverse these trends, more beach closures and water pollution are likely in years to come.

Sprawling, reckless development in coastal regions is creating runoff pollution and destroying natural areas

Rainfall that flows over lawns, parks, roads and other urban and suburban areas can pick up fecal waste from pets and wildlife, or carry sewage from failing septic or other sewage systems into waterways. This runoff can reach and contaminate beach waters, either by flowing directly into waterways or beach areas, or by passing through and discharging from storm sewer systems. Stormwater runoff is responsible for hundreds of miles of shoreline being too polluted for swimming or other intended uses, according to the U.S. EPA's most recent Water Quality Assessment data.[17]

Heavy development of coastal zones, and the resulting loss of natural areas, is exacerbating the problem of runoff pollution. From 1996 to 2016, U.S. coastal areas added 4.2 million acres of development, while losing 640,000 acres of wetland and almost 10 million acres of forest.[18] This development both creates new sources of runoff fecal pollution and also makes it easier for that pollution to reach the water by replacing natural vegetated areas with impervious surfaces.

Natural features like wetlands – often known as marshes, bogs and swamps – play an important function in protecting water quality. Wetlands can absorb runoff and remove harmful pollutants, including fecal contamination, preventing the contamination of coastal waters and other waterways.[19]

When a natural area is replaced by roads, parking lots and other impervious surfaces, we lose nature's ability to absorb stormwater. Instead, heavy rains sweep bacteria, heavy metals and other contaminants into nearby waterways or overwhelm sewage systems.

Research links increased amounts of impervious surface in an area with negative water quality impacts, including higher levels of fecal indicator bacteria. A 2014 study from the journal *Hydrological Processes* noted that an "increase in impervious surfaces will intensify current undesired impacts of development by converting even more rainfall to stormwater runoff" and that "[c]oncentrations of indicators of water quality

degradation (e.g., chemicals, nutrients, bacteria, viruses) increase in waterways as development increases."[20]

Climate change is further exacerbating the problem of runoff pollution, as flooding and heavy rainfall events become more frequent. The aforementioned study noted that "[i]ncreased rainfall from heavy storm events will amplify the negative impacts of runoff that are already intensified by increasing development." [21] A separate study modeled climate and development impacts in one county in South Carolina and found that runoff quantity could triple under severe climate change scenarios.[22]

America's sewage infrastructure is deteriorating and outdated

Sewage systems leak or overflow tens of thousands of times each year in the U.S., spilling untreated or under-treated human fecal waste into the environment and often contaminating rivers, lakes and coastal waters.[23] Compared to some other sources of fecal contamination, sewage is thought to be particularly dangerous because human waste contains bacteria, viruses and parasites more likely to cause disease in humans.[24] Sewage pollution, both from urban sewage systems and septic tanks, is responsible for more miles of shoreline being too polluted for swimming or other intended uses than any other source of pollution.[25]

As with runoff, the threat of sewage spills is exacerbated by the loss of green space and the development of natural areas, as the same stormwater that can directly impact waterways can also overwhelm sewer systems. As a *New York Times* analysis described:[26]

> *As cities have grown rapidly across the nation, many have neglected infrastructure projects and paved over green spaces that once absorbed rainwater. That has contributed to sewage backups into more than 400,000 basements and spills into thousands of streets, according to data collected by state and federal officials. Sometimes, waste has overflowed just upstream from drinking water intake points or near public beaches.*

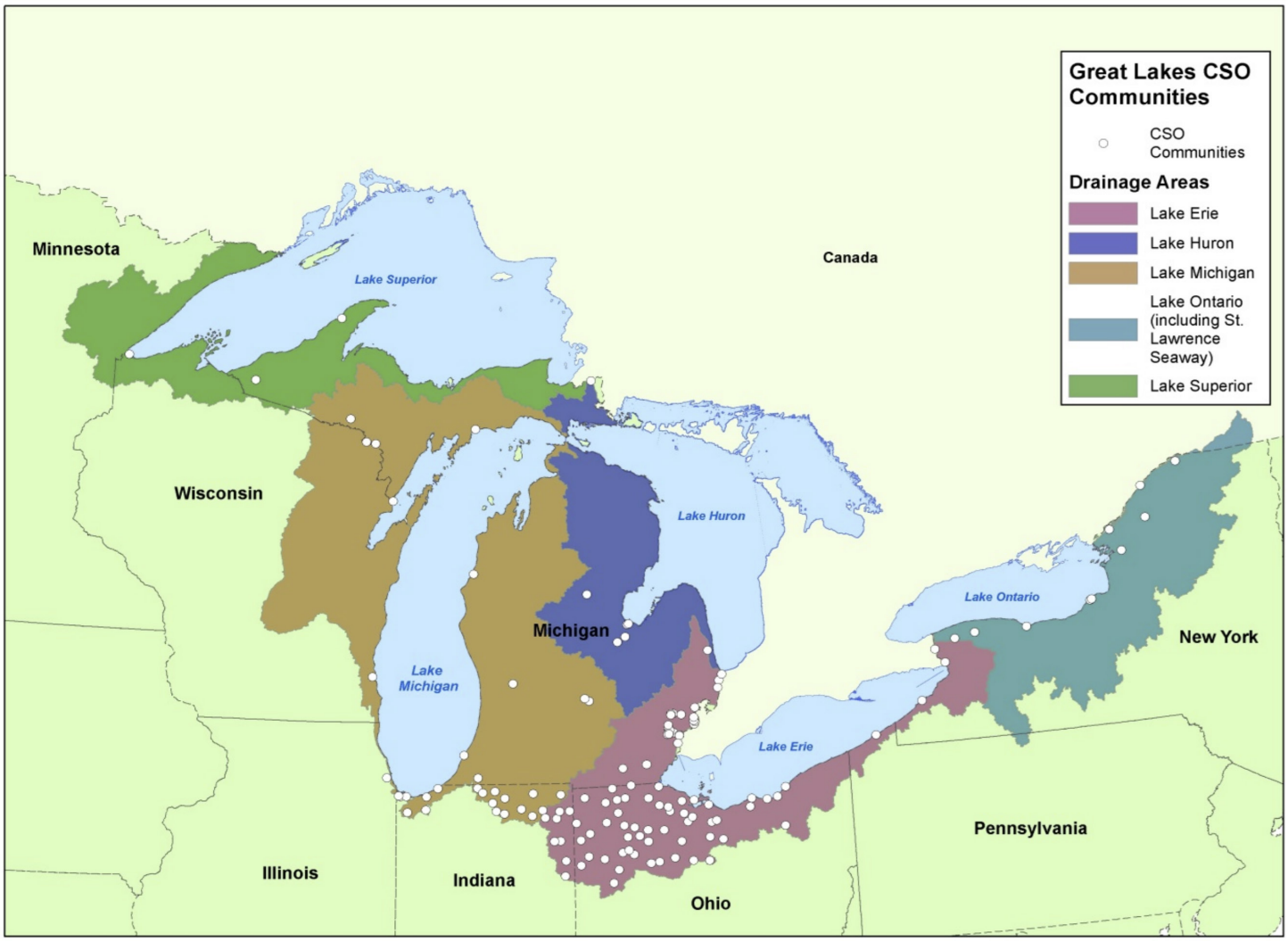
Meanwhile, sewage is often handled by deteriorating, poorly maintained, or outdated sewer systems. The EPA writes that much of our network of sewage infrastructure was built right after World War II and that "investment has not been enough to meet the ongoing need to maintain and renew these systems."[27]

Some of the worst spills come from "combined sewer" systems, outdated systems that combine stormwater and sewage into a single pipe. These systems were designed to discharge excess waste directly to nearby waterways during heavy rain events.[28] Combined sewers are particularly common near the Great Lakes. In 2014, combined sewer overflows in the U.S. discharged 22 billion gallons of untreated sewage and stormwater to the Great Lakes.[29]

Combined sewer spills can pollute and shut down recreational beaches. In 2019, for example, the L Street Beach in Belmar, New Jersey, shut down for a month because of discharges from a nearby combined sewer system.[30] Belmar was able to reopen the beach after making investments in nearby sewage pipes and pumps.[31] Yet experts note that the problem goes beyond old sewage infrastructure: The root causes are statewide development trends and rapidly diminishing green space, which have increased stormwater runoff and overwhelmed sewage systems across the state.[32]

Sanitary sewers, which are designed to carry sewage alone, are less prone to overflows than combined sewers, yet can also spill dangerous sewage if they are overwhelmed or poorly maintained.[33] Sanitary sewers overflow as many as 75,000 times each year in the U.S.[34] Deteriorating sewers can experience exfiltration (sewage leaking from pipes) or infiltration (groundwater or stormwater entering pipes, which can then cause overflows).[35] Storm events and high water levels can also overwhelm sewage treatment plants themselves, which can be located near coasts and waterways.[36]

Private septic systems, which are used by approximately one in four Americans, are also a major source of sewage pollution that affects beaches and coastal areas.[37] Septic systems have a failure rate of between 5% and 35%.[38] Septic system maintenance typically depends on homeowners, and research has found that many septic system owners may not understand how often maintenance is required, or the importance of maintenance for the environment and public health.[39] Septic systems are often used in areas with sprawling development, where building centralized sewer and water treatment systems is difficult or prohibitively expensive.[40]



Dozens of communities with polluting combined sewer systems are near the Great Lakes. Combined sewer overflows discharge millions of gallons of untreated sewage to the Great Lakes each year. Credit: EPA

Industrial livestock operations threaten beaches with manure pollution

According to the National Association of Local Boards of Health, fecal pollution from agriculture is "responsible for many beach closures and shellfish restrictions."[41] This pollution risk is markedly worse at factory farms (also known as "concentrated animal feeding operations" or CAFOs), because of the sheer volume of manure generated.

In recent decades, meat and dairy production in America has radically shifted from small farms to industrial-scale operations.[42] In 1992, for example, fewer than one third of all hogs were raised on farms with more than 2,000 animals; in 2012, 97% of hogs were.[43]

As of the end of 2019, there were nearly 21,000 "large" CAFOs in the United States, defined as operations with at least 1,000 cattle, 10,000 swine or 125,000 chickens.[44]

On traditional smaller farms, animal droppings could often be naturally dispersed and absorbed by crops or pasture. At today's densely packed facilities, however, the volume of manure generated is far greater than surrounding cropland can absorb. This almost inevitably leads to the overapplication of manure. Rain can then sweep the excess into nearby creeks, rivers and streams.

Some types of CAFOs – typically hog and dairy farms – store large volumes of manure in lagoons.[45] These lagoons can be inundated during heavy storms, causing manure to flow into nearby waterways.[46]

Nationally, industrial-scale livestock operations generate hundreds of millions of tons of manure each year.[47] This contamination can reach beaches, either washing directly from manure lagoons or livestock facilities, or as runoff after it is applied to crops as fertilizer.[48]

Many livestock operations are near America's coastal and Great Lakes beaches. Cattle farming is common in coastal areas of California and Florida, and hogs and pigs are raised intensively in coastal areas of North Carolina.[49] In all three states, livestock waste has been implicated in water quality problems at or near the coast, including high levels of fecal indicator bacteria.[50] Livestock waste also contributes to fecal pollution in the Great Lakes, including waste from cattle raised in Wisconsin near the shore of Lake Michigan.[51]

Recreational contact with water contaminated by livestock waste is dangerous. Animal manure can contain a variety of bacterial and viral pathogens that cause disease in humans.[52] Cattle feces likely pose particular risk, and may pose risks similar to human waste.[53]

Agricultural waste likely poses additional health risk because of the heavy use of antibiotics on livestock, which has contributed to the rise of antibiotic-resistant bacteria that cause illnesses that can be difficult or impossible to treat. In EPA's 2018 review of its recreational water criteria, the agency devoted an entire chapter to the health threat posed by resistant bacteria in recreational water, writing that "[d]rug-resistant bacteria and associated genes have become an emerging concern regarding the protection of human health during recreational activities in surface waters."[54] EPA cited one study showing that water downstream from concentrated swine operations can contain high levels of enterococci and *E. coli* exhibiting resistance to antibiotics such as erythromycin and tetracycline.[55]

Other factors affecting bacteria levels and health risk

Runoff from development, sewage overflows, and manure from factory farms pose major threats to the safety of beaches across the country. At individual beaches, however, the causes of day-to-day bacteria levels are varied, and can include other sources.

Certain beaches are more susceptible to contamination. Factors including rainfall, water flow and physical beach layout have an impact on bacteria levels and susceptibility to contamination. EPA notes that, in recent years, "several studies have highlighted the importance of significant rainfall in determining the degree of water contamination."[56] A study in Southern California found that storms with more than 6 millimeters of rainfall "consistently led to beach water quality degradation."[57] The physical layout of beaches also impacts pollution levels. A state of California study found that enclosed beaches – for example beaches in enclosed bays or harbors, often with weaker currents – were five times more likely than open coastal beaches to exceed state standards for fecal bacteria.[58]

Some sources of contamination are outside of human control. Not all contamination results from human activity or pollution. Birds, aquatic animals and other forms of wildlife generate waste and bacteria.[59] This means that even pristine areas may occasionally have days where bacteria readings are high. Contamination can also result from humans using a beach for recreational purposes.

Bacteria from natural sources can be less indicative of risk. Because there are a variety of sources of fecal indicator bacteria, not all bacteria signify the same level of risk. Bacteria from wildlife may not always signify the same risk to humans as bacteria in human waste or the waste of certain livestock. One study from *Epidemiology* noted that some animals can shed "bacterial indicators without certain accompanying human pathogens."[60] Indeed, fecal indicator bacteria may not always indicate the presence of fecal matter at all, as the bacteria can exist in other sources including sand, soil and marine vegetation.[61] In setting its water quality criteria and Beach Action Values, EPA considered the differences in risk posed by various bacteria sources.[62]

American beaches are often unsafe for swimming

Testing data collected from around the country reveal that, all too often, beach water may be unsafe for swimming.

As of May 2021, water quality data for 2020 from 3,166 beaches in 29 coastal and Great Lakes states and Puerto Rico was available through the National Water Quality Monitoring Council's Water Quality Portal.[63] "Beaches" refers to recreation waters listed under the Beaches Environmental Assessment and Coastal Health Act (BEACH Act).

Of those beaches, 1,689 (53%) were potentially unsafe for swimming on at least one day during 2020, and 328 were potentially unsafe on at least 25% of the days that sampling took place.

Beaches were considered potentially unsafe if fecal indicator bacteria levels exceeded the U.S. Environmental Protection Agency's most protective "Beach Action Value," which EPA suggests states use as a "conservative, precautionary tool for making beach notification decisions."[64] As many states use different criteria for beach closure and notification decisions, results presented in this report may differ from those in state reports on beach water quality. (See Methodology for details.)

Data for 2020 indicates potentially unsafe levels of fecal contamination in every region of the country.

- Among East Coast beaches, 837 beaches, or 47% of the 1,798 beaches tested, were potentially unsafe for at least one day in 2020. 113 beaches, 6% of those tested, were potentially unsafe on at least 25% of the days that testing took place.
- Among Great Lakes beaches, 297 beaches, or 60% of the 497 beaches tested, were potentially unsafe for at least one day in 2020. 59 beaches, 12% of those tested, were potentially unsafe on at least 25% of the days that testing took place.
- Among Gulf Coast beaches, 220 beaches, or 82% of the 268 beaches tested, were potentially unsafe for at least one day in 2020. 75 beaches, 28% of those tested, were potentially unsafe on at least 25% of the days that testing took place.
- Among West Coast beaches, 252 beaches, or 72% of the 351 beaches tested, were potentially unsafe for at least one day in 2020. 62 beaches, 18% of those tested, were potentially unsafe on at least 25% of the days that testing took place.

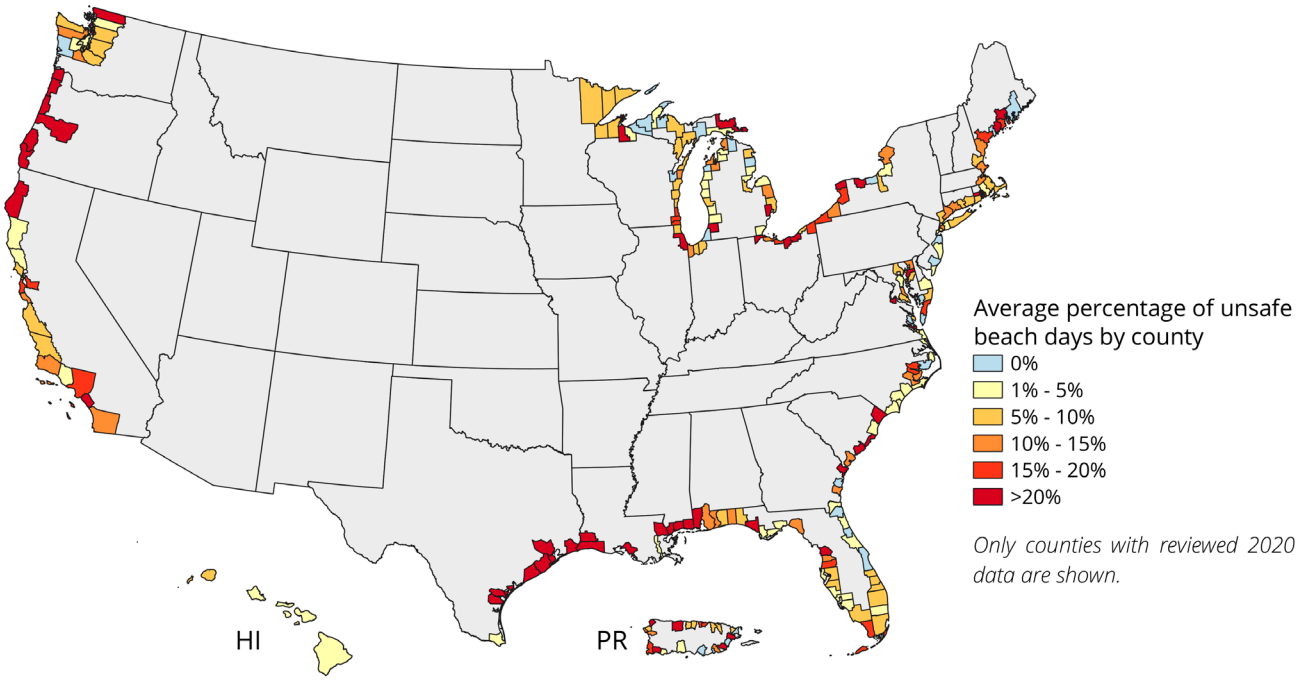


Figure 1. Average percentage of potentially unsafe beach days in 2020 by county
"Average percentage" represents the average of the percentage of potentially unsafe days at each beach within a county.

Differences in beach testing can affect water quality data

Water quality data presented in this report is not necessarily comparable between beaches, counties or states, as sampling techniques, reporting practices, frequency of testing and other factors vary by agency and by site.

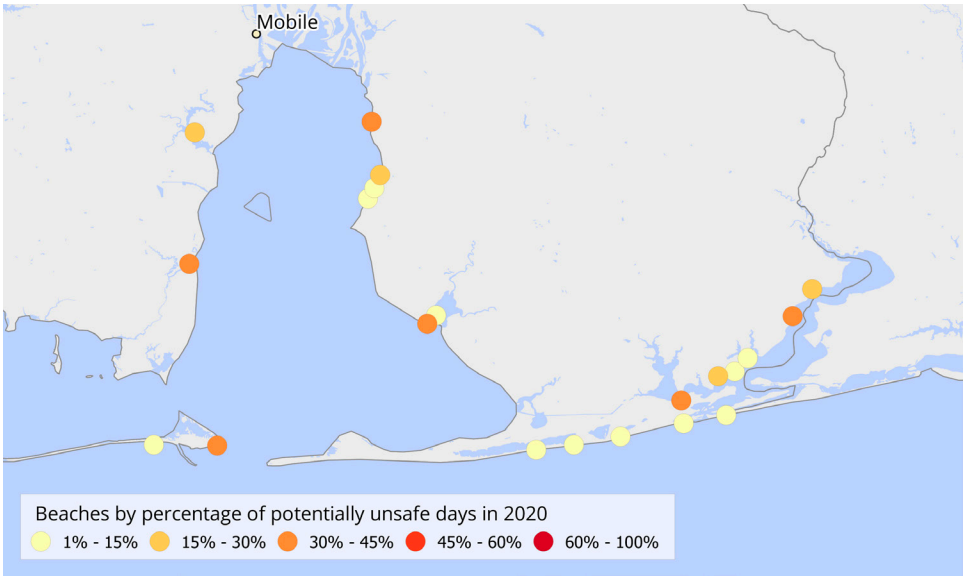
For some beaches, results are reported as a daily summary of multiple individual samples, with the potential to mask certain high bacteria readings. Some states conduct additional sampling following rainfall, pollution events like sewage spills, or as follow-up to samples showing high bacteria counts, creating the potential for those beaches to show a higher percentage of potentially unsafe days than if sampling had occurred at regular intervals.[65] At the same time, some states suspend testing when weather or other conditions have already resulted in a swimming advisory, a protocol that likely reduces the number of tests showing potentially unsafe water quality.[66]

States and testing agencies also test for different seasons; warm weather states tend to test year-round, for example, while northern states generally limit testing to summer months. Many beaches are not monitored at all and may present risks that are unaddressed in this report.[67]

Additionally, some beaches are tested more than others, including multiple times per day or at multiple testing sites (beaches with multiple testing sites are marked with an asterisk in state tables below). Of the 1,366 beaches assessed for this report, 12 beaches had more than 10 testing sites in 2020, and depending on test frequency that may mean more chances for a high bacterial reading on any given day.[68]

Beach data in this report is also not comparable with previous editions of this report, for both methodological and other reasons. The first edition of this report assessed individual test sites, not beaches; and this report assesses a slightly different set of beaches than the 2020 report. In addition, testing agencies may change their practices from year to year, including because of COVID-19 during 2020.

Beach pollution by state



Top beach sites by most potentially unsafe swimming days in Alabama in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Spanish Cove	Baldwin County	14	37	38%
Orange Beach Waterfront Park	Baldwin County	12	38	32%
Mary Ann Nelson Beach	Baldwin County	10	24	42%
May Day Park	Baldwin County	10	32	31%
Fowl River at Highway 193	Mobile County	10	33	30%
Dog River at Alba Club	Mobile County	9	34	26%
Kee Avenue	Baldwin County	9	35	26%
Volanta Avenue	Baldwin County	6	31	19%
Camp Beckwith	Baldwin County	6	52	12%
Pirate's Cove	Baldwin County	5	32	16%

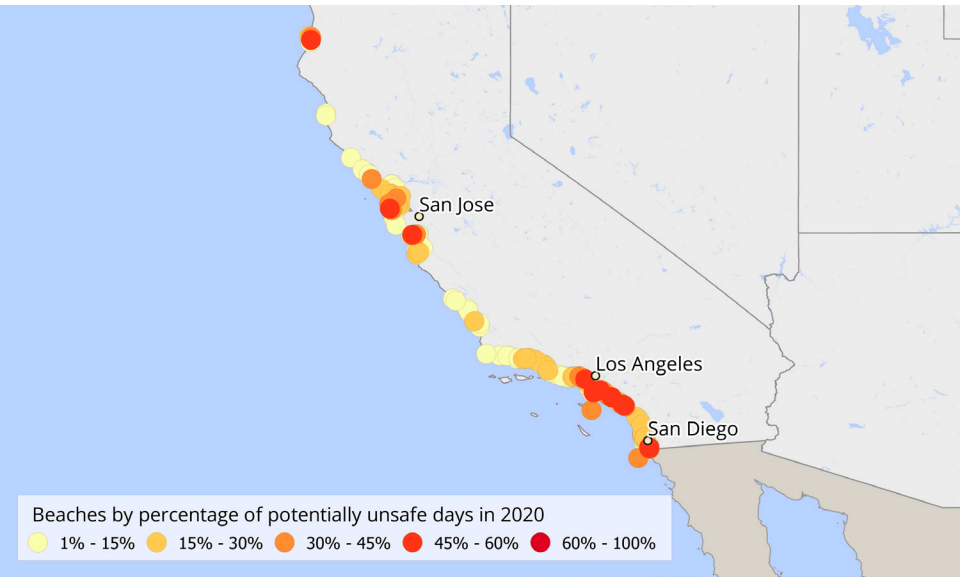
Average percentage of potentially unsafe days in Alabama by county in 2020

County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Mobile County	25%	4
Baldwin County	14%	20

Alabama

In Alabama, 21 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 24 beaches were tested for fecal indicator bacteria in Alabama. At 21 of those beaches, testing found potentially unsafe water on at least one day, and eight beaches were potentially unsafe on at least 25% of the days they were tested. Spanish Cove in Baldwin County tested as potentially unsafe for 14 days, more days than any other beach in the state, and 38% of the days that sampling took place. In Mobile County, the average beach was potentially unsafe for swimming on 25% of the days that sampling took place, a higher percentage than any other county in the state.



Top beach sites by most potentially unsafe swimming days in California in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Marina Del Rey at Mother's Beach*†	Los Angeles County	165	307	54%
Inner Cabrillo Beach*†	Los Angeles County	141	253	56%
Santa Monica State Beach*†	Los Angeles County	120	299	40%
Imperial Beach*†	San Diego County	102	221	46%
Tijuana Slough National Wildlife Refuge*†	San Diego County	101	179	56%
Topanga State Beach†	Los Angeles County	93	255	36%
Border Field State Park*†	San Diego County	78	178	44%
Long Beach*	Los Angeles County	77	148	52%
North Imperial Beach†	San Diego County	58	205	28%
Imperial Beach Pier Area†	San Diego County	54	162	33%

Average percentage of potentially unsafe days in California by county in 2020

Table limited to counties with highest average percentage of potentially unsafe days.

County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Humboldt County†	30%	5
Orange County	22%	22
Alameda County	18%	2
San Mateo County†	17%	20
Los Angeles County†	16%	32
San Francisco County†	14%	8
Santa Cruz County†	12%	23
San Diego County†	12%	49
Santa Barbara County†	11%	15
San Luis Obispo County†	7%	10

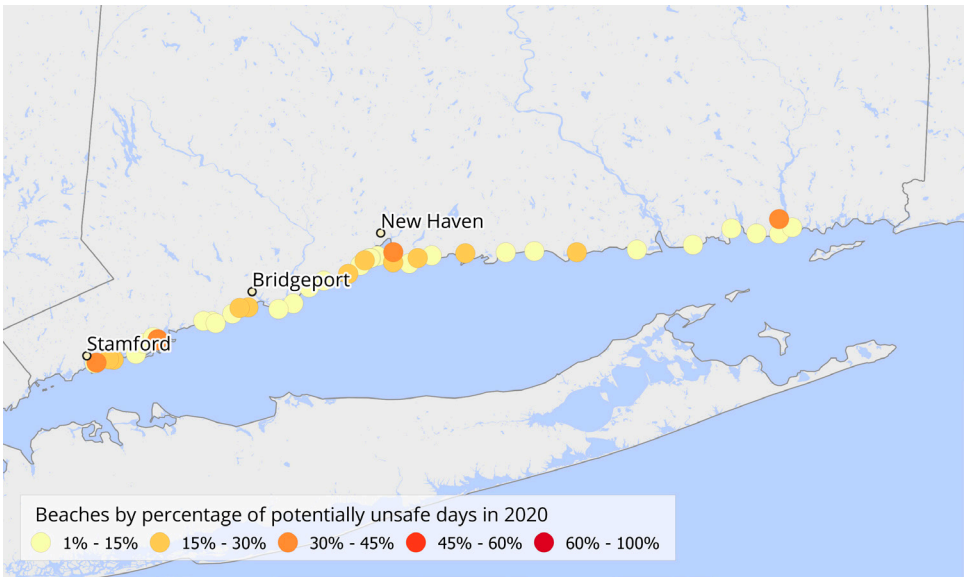
California

In California, 193 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 258 beaches were tested for fecal indicator bacteria in California. At 193 of those beaches, testing found potentially unsafe water on at least one day, and 42 beaches were potentially unsafe on at least 25% of the days they were tested. Marina Del Rey at Mother's Beach in Los Angeles County tested as potentially unsafe for 165 days, more days than any other beach in the state, and 54% of the days that sampling took place. In Humboldt County, the average beach was potentially unsafe for swimming on 30% of the days that sampling took place, a higher percentage than any other county in the state.

* Beach has more than one associated testing site, which may affect number of potentially unsafe days.

† Some beach water quality tests assessed E. coli for marine water, for which no Beach Action Value is available. Those tests were not considered in calculating potentially unsafe days.



Top beach sites by most potentially unsafe swimming days in Connecticut in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Calf Pasture Beach*	Fairfield County	7	18	39%
Fort Hale Park Beach*	New Haven County	7	20	35%
Cummings Beach*	Fairfield County	6	15	40%
Green Harbor Beach	New London County	6	16	38%
Shady Beach*	Fairfield County	5	15	33%
Lighthouse Point Beach*	New Haven County	5	20	25%
Seabright Beach	Fairfield County	4	14	29%
Seaside Park Beach*	Fairfield County	4	14	29%
Pear Tree Point Beach*	Fairfield County	4	15	27%
Weed Beach*	Fairfield County	4	15	27%

Average percentage of potentially unsafe days in Connecticut by county in 2020

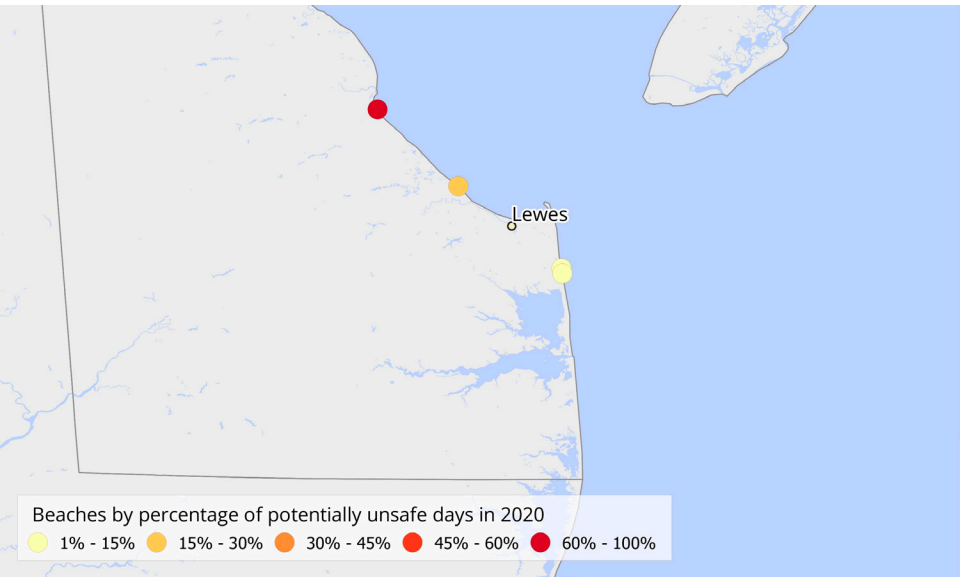
County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Fairfield County	14%	24
New Haven County	11%	25
New London County	6%	12
Middlesex County	6%	4

* Beach has more than one associated testing site, which may affect number of potentially unsafe days.

Connecticut

In Connecticut, 46 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 65 beaches were tested for fecal indicator bacteria in Connecticut. At 46 of those beaches, testing found potentially unsafe water on at least one day, and 11 beaches were potentially unsafe on at least 25% of the days they were tested. Two beaches – Calf Pasture Beach in Fairfield County, and Fort Hale Park Beach in New Haven County – tested as potentially unsafe for seven days, more than any other beaches in the state. In Fairfield County, the average beach was potentially unsafe for swimming on 14% of the days that sampling took place, a higher percentage than any other county in the state.



Top beach sites by most potentially unsafe swimming days in Delaware in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Slaughter Beach	Sussex County	10	16	62%
Broadkill Beach	Sussex County	3	16	19%
Rehoboth Beach at Rehoboth Ave.	Sussex County	2	30	7%
Rehoboth Beach at Virginia Ave.	Sussex County	1	16	6%

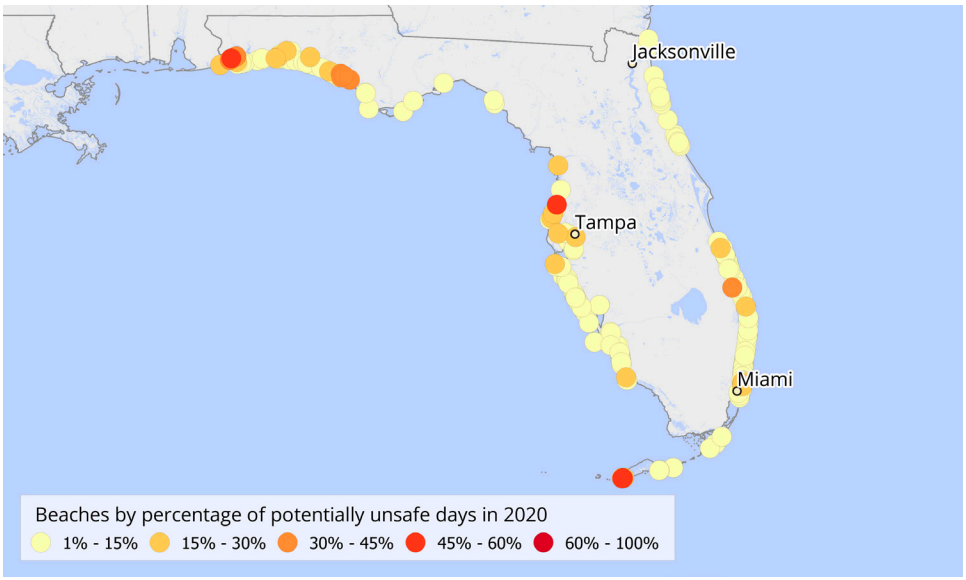
Average percentage of potentially unsafe days in Delaware by county in 2020

County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Sussex County	4%	23

Delaware

In Delaware, four tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 23 beaches were tested for fecal indicator bacteria in Delaware. At four of those beaches, testing found potentially unsafe water on at least one day, and one beach was potentially unsafe on at least 25% of the days it was tested. Slaughter Beach in Sussex County tested as potentially unsafe for 10 days, more days than any other beach in the state, and 62% of the days that sampling took place. In Sussex County, the only county where testing took place in 2020, the average beach was potentially unsafe for swimming on 4% of the days that sampling took place.



Top beach sites by most potentially unsafe swimming days in Florida in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
South Beach	Monroe County	19	33	58%
Higgs Beach	Monroe County	17	35	49%
Roosevelt Bridge	Martin County	17	53	32%
Bayou Texar	Escambia County	16	46	35%
Bayou Chico	Escambia County	15	29	52%
Beach Drive	Bay County	15	35	43%
Delwood Beach	Bay County	15	35	43%
Carl Gray Park	Bay County	14	35	40%
Miami Beach by 53rd St.	Miami-Dade County	14	58	24%
Dupont Bridge	Bay County	13	35	37%

Average percentage of potentially unsafe days in Florida by county in 2020

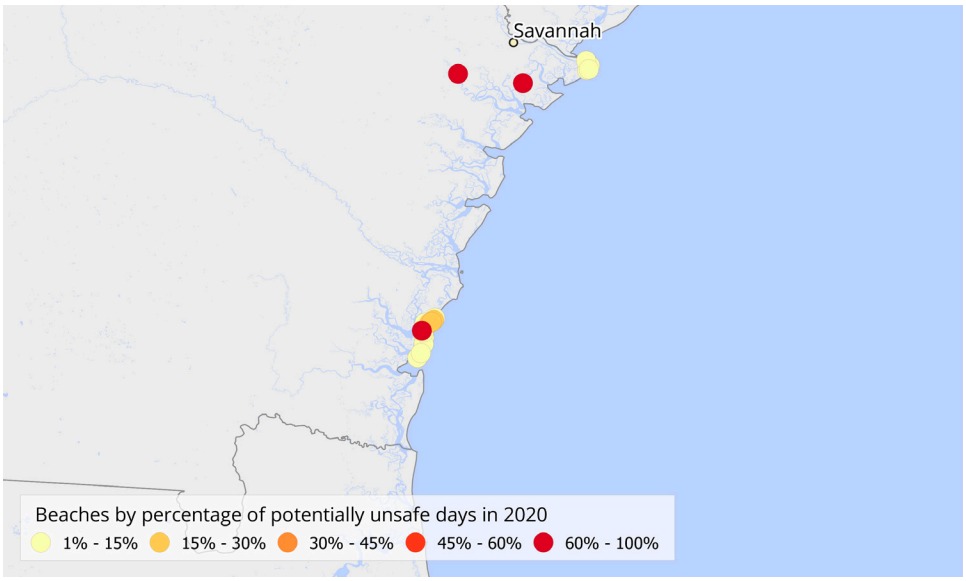
Table limited to counties with highest average percentage of potentially unsafe days. Note that some counties only had monitoring data for one beach in 2020.

County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Bay County	23%	10
Citrus County	22%	1
Pasco County	19%	5
Monroe County	15%	11
Hernando County	15%	1
Escambia County	14%	13
Taylor County	13%	2
Okaloosa County	11%	10
Miami-Dade County	10%	16
Walton County	10%	8

Florida

In Florida, 185 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 266 beaches were tested for fecal indicator bacteria in Florida. At 185 of those beaches, testing found potentially unsafe water on at least one day, and 13 beaches were potentially unsafe on at least 25% of the days they were tested. South Beach in Monroe County tested as potentially unsafe for 19 days, more days than any other beach in the state, and 58% of the days that sampling took place. In Bay County, the average beach was potentially unsafe for swimming on 23% of the days that sampling took place, a higher percentage than any other county in the state.



Top beach sites by most potentially unsafe swimming days in Georgia in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Massengale Park	Glynn County	12	49	24%
East Beach	Glynn County	7	44	16%
5th St. Crossover	Glynn County	7	46	15%
Jekyll Driftwood Beach	Glynn County	6	45	13%
St. Simons Island Lighthouse	Glynn County	6	45	13%
Tybee Island by Strand Ave.	Chatham County	5	43	12%
Skidaway Narrows	Chatham County	4	6	67%
Jekyll Island at South Dunes	Glynn County	4	41	10%
Tybee Island by Polk St.	Chatham County	4	43	9%
St. Simons Island by 12th St.	Glynn County	4	44	9%

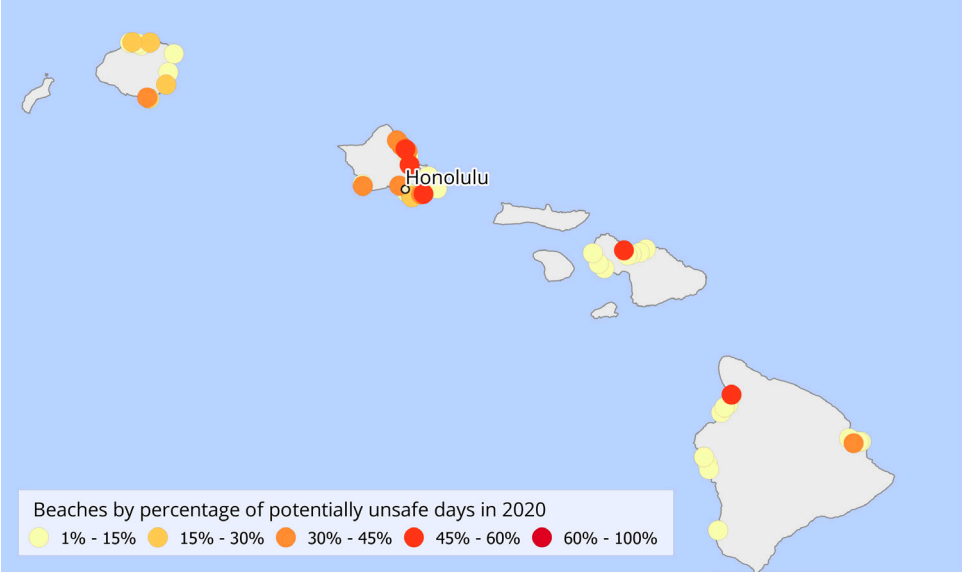
Average percentage of potentially unsafe days in Georgia by county in 2020

County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Chatham County	27%	7
Glynn County	11%	17
McIntosh County	0%	2

Georgia

In Georgia, 17 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 26 beaches were tested for fecal indicator bacteria in Georgia. At 17 of those beaches, testing found potentially unsafe water on at least one day, and three beaches were potentially unsafe on at least 25% of the days they were tested. Massengale Park in Glynn County tested as potentially unsafe for 12 days, more days than any other beach in the state, and 24% of the days that sampling took place. In Chatham County, the average beach was potentially unsafe for swimming on 27% of the days that sampling took place, a higher percentage than any other county in the state.



Top beach sites by most potentially unsafe swimming days in Hawaii in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Kalapaki Beach	Kauai County	10	44	23%
Ke'e Beach	Kauai County	4	38	11%
Kahanamoku Beach*	Honolulu County	4	48	8%
Laenani Park	Honolulu County	3	5	60%
Kawaiku'i Beach Park	Honolulu County	3	6	50%
Hanakao'o Park	Maui County	3	27	11%
Lydgate State Park	Kauai County	3	34	9%
Royal-Moana Beach	Honolulu County	3	44	7%
Kailua Bay*	Hawaii County	3	58	5%
Ice Pond	Hawaii County	2	5	40%
Koloa Landing	Kauai County	2	5	40%

Average percentage of potentially unsafe days in Hawaii by county in 2020

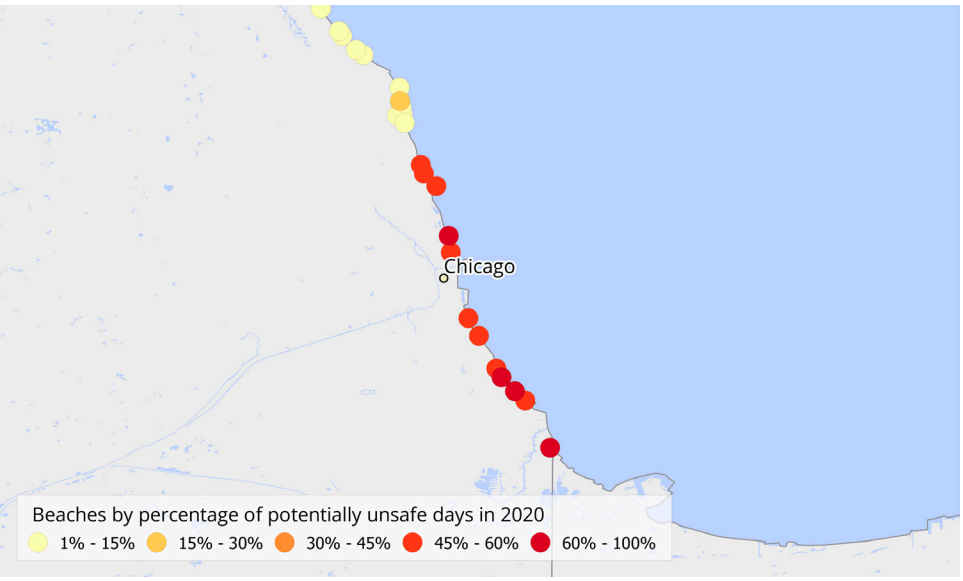
County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Kauai County	5%	33
Hawaii County	4%	34
Honolulu County	4%	110
Maui County	2%	41

* Beach has more than one associated testing site, which may affect number of potentially unsafe days.

Hawaii

In Hawaii, 55 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 218 beaches were tested for fecal indicator bacteria in Hawaii. At 55 of those beaches, testing found potentially unsafe water on at least one day, and 14 beaches were potentially unsafe on at least 25% of the days they were tested. Kalapaki Beach in Kauai County tested as potentially unsafe for 10 days, more days than any other beach in the state, and 23% of the days that sampling took place. In Kauai County, the average beach was potentially unsafe for swimming on 5% of the days that sampling took place, a higher percentage than any other county in the state.



Top beach sites by most potentially unsafe swimming days in Illinois in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Evanston Clark Beach	Cook County	16	88	18%
Glencoe Park Beach	Cook County	12	97	12%
North Point Marina Beach	Lake County	11	58	19%
Waukegan South Beach	Lake County	6	58	10%
Evanston South Beach	Cook County	6	88	7%
Evanston Greenwood Beach	Cook County	5	84	6%
Northwestern University Beach	Cook County	5	88	6%
Highland Park Rosewood Beach	Lake County	5	91	5%
Winnetka Tower Beach	Cook County	5	92	5%
Illinois Beach State Park - South Beach	Lake County	4	50	8%

Average percentage of potentially unsafe days in Illinois by county in 2020

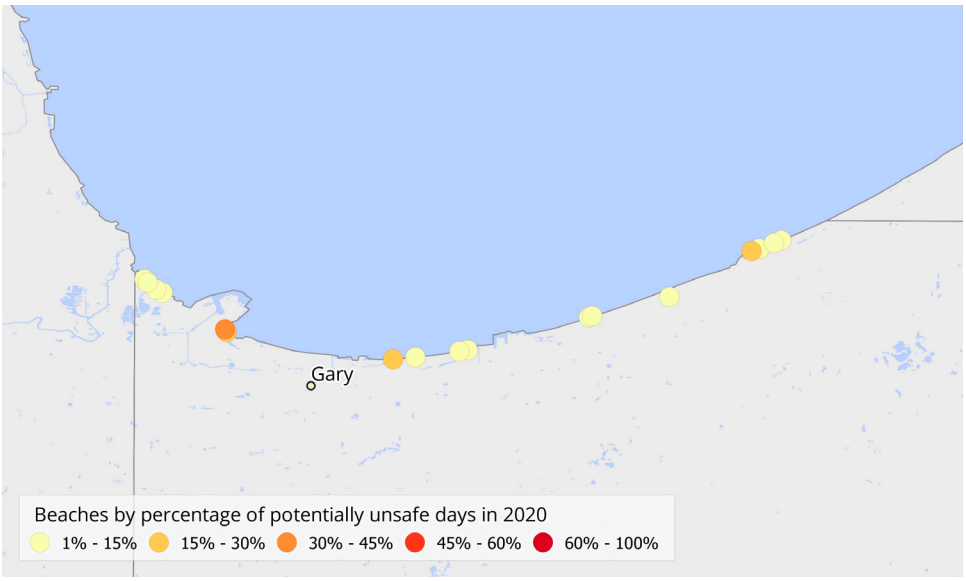
County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Cook County	29%	30
Lake County	6%	11

Illinois

In Illinois, 32 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 41 beaches were tested for fecal indicator bacteria in Illinois.* At 32 of those beaches, testing found potentially unsafe water on at least one day, and 12 beaches were potentially unsafe on at least 25% of the days they were tested. Evanston Clark Beach in Cook County tested as potentially unsafe for 16 days, more days than any other beach in the state, and 18% of the days that sampling took place. In Cook County, the average beach was potentially unsafe for swimming on 29% of the days that sampling took place, a higher percentage than any other county in the state.

* Some state beach data is from alternate data source. See Methodology for details.



Top beach sites by most potentially unsafe swimming days in Indiana in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Jeorse Park Beach I	Lake County	27	84	32%
Washington Park Beach	LaPorte County	25	114	22%
Jeorse Park Beach II	Lake County	19	84	23%
Buffington Harbor Beach	Lake County	18	84	21%
Indiana Dunes State Park East Beach	Porter County	12	106	11%
Hammond Marina East Beach	Lake County	12	107	11%
Whihala Beach West	Lake County	11	109	10%
Indiana Dunes State Park West Beach	Porter County	10	104	10%
Lake Street Beach	Lake County	8	48	17%
Ogden Dunes West Beach	Porter County	6	105	6%

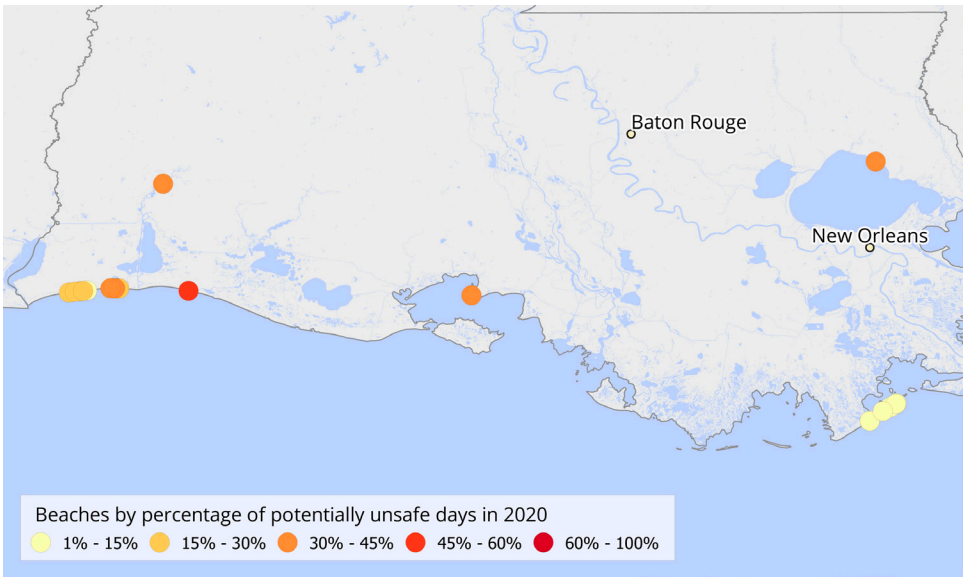
Average percentage of potentially unsafe days in Indiana by county in 2020

County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Lake County	13%	10
Porter County	7%	5
LaPorte County	6%	6

Indiana

In Indiana, 18 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 21 beaches were tested for fecal indicator bacteria in Indiana. At 18 of those beaches, testing found potentially unsafe water on at least one day, and one beach was potentially unsafe on at least 25% of the days it was tested. Jeorse Park Beach I in Lake County tested as potentially unsafe for 27 days, more days than any other beach in the state, and 32% of the days that sampling took place. In Lake County, the average beach was potentially unsafe for swimming on 13% of the days that sampling took place, a higher percentage than any other county in the state.



Top beach sites by most potentially unsafe swimming days in Louisiana in 2020

Beach name	Parish	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Rutherford Beach	Cameron Parish	12	26	46%
Cypremort Point Beach	St. Mary Parish	12	28	43%
Fontainebleau Beach	St. Tammany Parish	11	26	42%
Lake Charles North Beach	Calcasieu Parish	10	27	37%
Holly Beach - Site 6	Cameron Parish	9	21	43%
Holly Beach - Site 3	Cameron Parish	7	21	33%
Holly Beach - Site 4	Cameron Parish	7	21	33%
Gulf Breeze Beach	Cameron Parish	6	21	29%
Holly Beach - Site 1	Cameron Parish	6	21	29%
Holly Beach - Site 5	Cameron Parish	6	21	29%

Average percentage of potentially unsafe days in Louisiana by parish in 2020

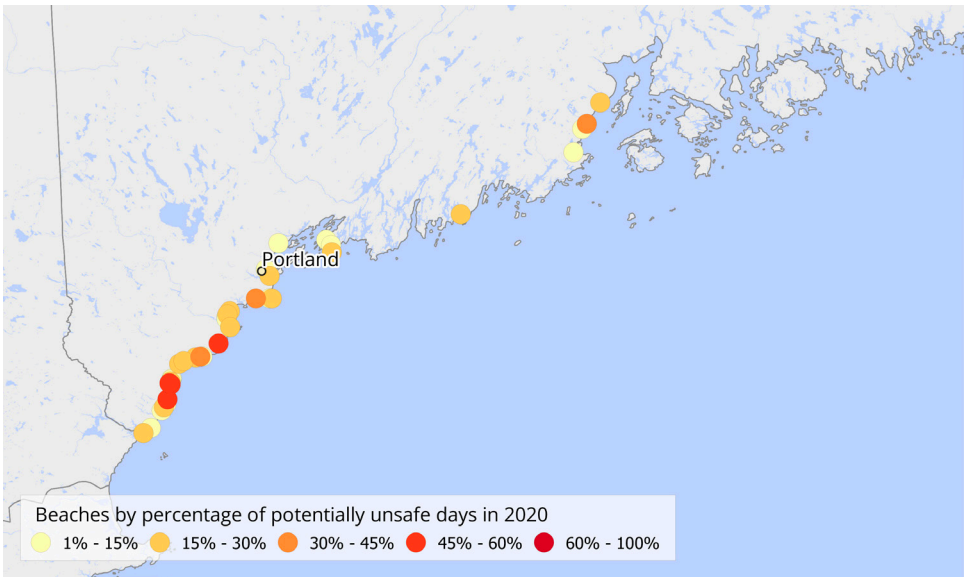
Note that some parishes only had monitoring data for one beach in 2020.

Parish	Average percentage of days with potentially unsafe water for beaches in parish	Number of tested beaches
St. Mary Parish	43%	1
St. Tammany Parish	42%	1
Calcasieu Parish	37%	1
Cameron Parish	29%	12
Jefferson Parish	4%	8

Louisiana

In Louisiana, 21 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 23 beaches were tested for fecal indicator bacteria in Louisiana. At 21 of those beaches, testing found potentially unsafe water on at least one day, and 10 beaches were potentially unsafe on at least 25% of the days they were tested. Two beaches – Rutherford Beach in Cameron Parish, and Cypremort Point Beach in St. Mary Parish – tested as potentially unsafe for 12 days, more than any other beaches in the state. In St. Mary Parish (with just one monitored beach in 2020), the average beach was potentially unsafe for swimming on 43% of the days that sampling took place, a higher percentage than any other parish in the state.



Top beach sites by most potentially unsafe swimming days in Maine in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Goose Rocks*	York County	14	26	54%
Riverside (Ogunquit)	York County	10	19	53%
Little Beach	York County	8	17	47%
Willard Beach	Cumberland County	7	24	29%
Cape Neddick Beach	York County	6	13	46%
Laite Beach	Knox County	6	17	35%
Gooch's Beach*	York County	5	15	33%
Lincolnville Beach	Waldo County	5	18	28%
Higgins Beach*	Cumberland County	4	13	31%
Ogunquit Beach	York County	4	14	29%

Average percentage of potentially unsafe days in Maine by county in 2020

Note that some counties only had monitoring data for one beach in 2020.

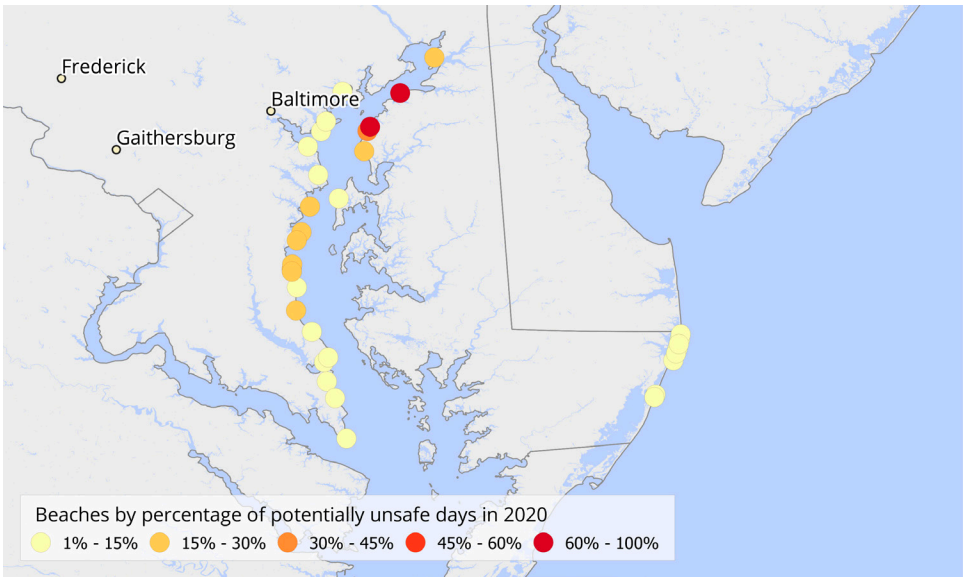
County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Lincoln County	29%	1
Waldo County	28%	1
Knox County	19%	3
Cumberland County	16%	10
York County	15%	35
Sagadahoc County	0%	6
Hancock County	0%	5

* Beach has more than one associated testing site, which may affect number of potentially unsafe days.

Maine

In Maine, 36 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 61 beaches were tested for fecal indicator bacteria in Maine. At 36 of those beaches, testing found potentially unsafe water on at least one day, and 15 beaches were potentially unsafe on at least 25% of the days they were tested. Goose Rocks in York County tested as potentially unsafe for 14 days, more days than any other beach in the state, and 54% of the days that sampling took place. In Lincoln County (with just one monitored beach in 2020), the average beach was potentially unsafe for swimming on 29% of the days that sampling took place, a higher percentage than any other county in the state.



Top beach sites by most potentially unsafe swimming days in Maryland in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Tolchester Estates Beach	Kent County	5	8	62%
Brownie's Beach	Calvert County	5	18	28%
North East Beach at Elk Neck State Park	Cecil County	4	14	29%
North Beach	Calvert County	4	17	24%
Ocean City Beach 4	Worcester County	3	35	9%
Tolchester Marina and Beach	Kent County	2	6	33%
Scientists Cliffs	Calvert County	2	7	29%
Oceanside Beach Site 3	Worcester County	2	15	13%
Breezy Point	Calvert County	2	16	12%
Elm's Beach	St. Mary's County	2	16	12%

Average percentage of potentially unsafe days in Maryland by county in 2020

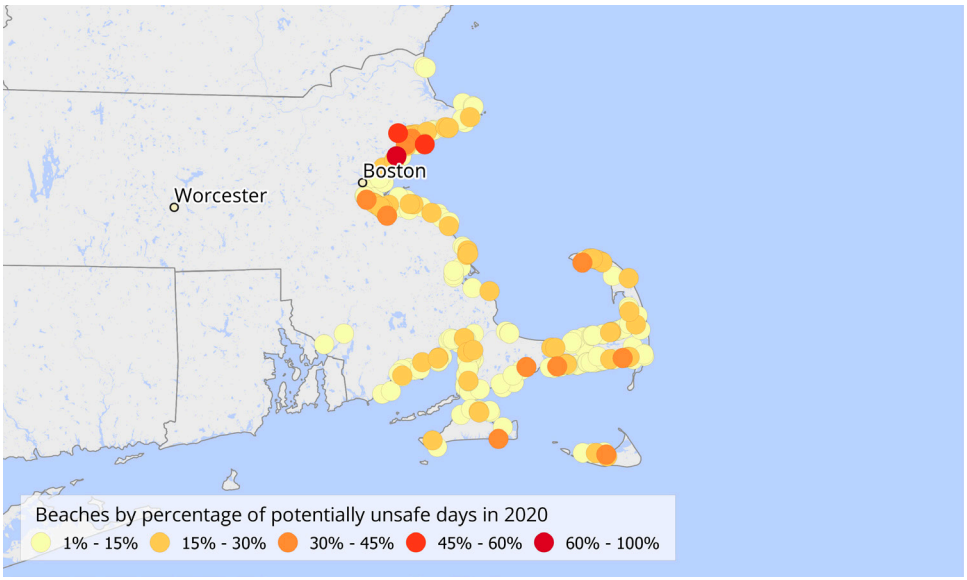
Note that some counties only had monitoring data for one beach in 2020.

County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Kent County	42%	5
Calvert County	14%	10
Cecil County	14%	2
St. Mary's County	9%	3
Baltimore County	8%	5
Queen Anne's County	6%	1
Worcester County	5%	10
Anne Arundel County	4%	24
Somerset County	0%	2

Maryland

In Maryland, 34 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 62 beaches were tested for fecal indicator bacteria in Maryland. At 34 of those beaches, testing found potentially unsafe water on at least one day, and six beaches were potentially unsafe on at least 25% of the days they were tested. Two beaches – Tolchester Estates Beach in Kent County, and Brownie's Beach in Calvert County – tested as potentially unsafe for five days, more than any other beaches in the state. In Kent County, the average beach was potentially unsafe for swimming on 42% of the days that sampling took place, a higher percentage than any other county in the state.



Top beach sites by most potentially unsafe swimming days in Massachusetts in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
King's Beach*	Essex County	64	85	75%
Tenean Beach	Suffolk County	29	85	34%
Wollaston Beach at Channing Street	Norfolk County	23	85	27%
Wollaston Beach at Milton Street	Norfolk County	19	85	22%
Wollaston Beach at Rice Road	Norfolk County	16	85	19%
Wollaston Beach at Sachem Street	Norfolk County	15	85	18%
Keyes Beach	Barnstable County	12	30	40%
Malibu Beach	Suffolk County	12	85	14%
Town Landing by Coast Guard	Barnstable County	11	26	42%
Sandy Beach	Essex County	8	14	57%

Average percentage of potentially unsafe days in Massachusetts by county in 2020

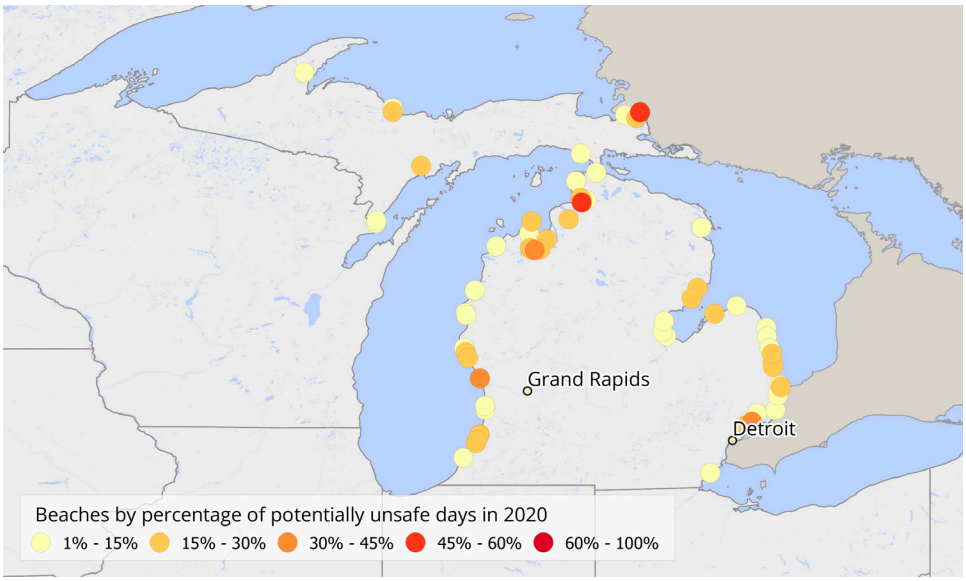
County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Norfolk County	12%	22
Essex County	11%	79
Suffolk County	7%	18
Nantucket County	6%	16
Plymouth County	6%	83
Barnstable County	6%	250
Dukes County	4%	44
Bristol County	2%	44

Massachusetts

In Massachusetts, 264 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 556 beaches were tested for fecal indicator bacteria in Massachusetts. At 264 of those beaches, testing found potentially unsafe water on at least one day, and 29 beaches were potentially unsafe on at least 25% of the days they were tested. King's Beach in Essex County tested as potentially unsafe for 64 days, more days than any other beach in the state, and 75% of the days that sampling took place. In Norfolk County, the average beach was potentially unsafe for swimming on 12% of the days that sampling took place, a higher percentage than any other county in the state.

* Beach has more than one associated testing site, which may affect number of potentially unsafe days.



Michigan

In Michigan, 69 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 196 beaches were tested for fecal indicator bacteria in Michigan. At 69 of those beaches, testing found potentially unsafe water on at least one day, and 15 beaches were potentially unsafe on at least 25% of the days they were tested. Lake St. Clair Metropark Beach in Macomb County tested as potentially unsafe for 17 days, more days than any other beach in the state, and 39% of the days that sampling took place. In Van Buren County, the average beach was potentially unsafe for swimming on 29% of the days that sampling took place, a higher percentage than any other county in the state.

Top beach sites by most potentially unsafe swimming days in Michigan in 2020

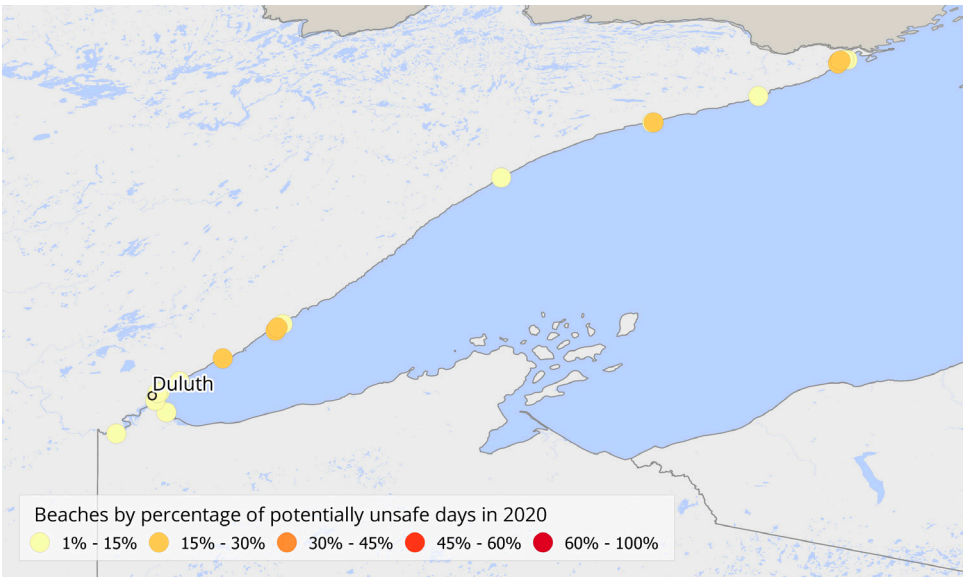
Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Lake St. Clair Metropark Beach	Macomb County	17	44	39%
St. Clair Shores Memorial Park Beach	Macomb County	9	33	27%
East Bay Park	Grand Traverse County	5	16	31%
Northport Bay Marina	Leelanau County	5	17	29%
Sugar Island Township Park	Chippewa County	4	8	50%
Conger-Lighthouse Beach	St. Clair County	4	16	25%
Caseville County Park	Huron County	4	17	24%
Sunset Park	Grand Traverse County	4	18	22%
Gladstone Beach at Van Cleve Park	Delta County	4	24	17%
Chrysler Park Beach	St. Clair County	4	29	14%

Average percentage of potentially unsafe days in Michigan by county in 2020

Table limited to counties with highest average percentage of potentially unsafe days.

County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Van Buren County	29%	4
Macomb County	25%	3
Chippewa County	23%	4
Sanilac County	15%	5
Leelanau County	13%	5

County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Grand Traverse County	12%	10
Emmet County	10%	11
Alpena County	9%	2
St. Clair County	9%	8
Delta County	8%	2



Top beach sites by most potentially unsafe swimming days in Minnesota in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Grand Portage Bay - Site 1†	Cook County	10	44	23%
Grand Portage Bay - Site 2†	Cook County	7	44	16%
Grand Marais Downtown Beach	Cook County	4	15	27%
Grand Portage Bay - Site 2.5†	Cook County	4	15	27%
Agate Bay Beach	Lake County	4	17	24%
Burlington Bay Beach	Lake County	4	17	24%
Leif Erikson Park Beach	St. Louis County	4	27	15%
Grand Portage Bay - Site 1.5†	Cook County	3	15	20%
Minnesota Point Harbor Side, 15th Street Beach	St. Louis County	3	27	11%
Grand Portage Bay - Site 4†	Cook County	3	44	7%
Grand Portage Bay - Site 6†	Cook County	3	44	7%

Average percentage of potentially unsafe days in Minnesota by county in 2020

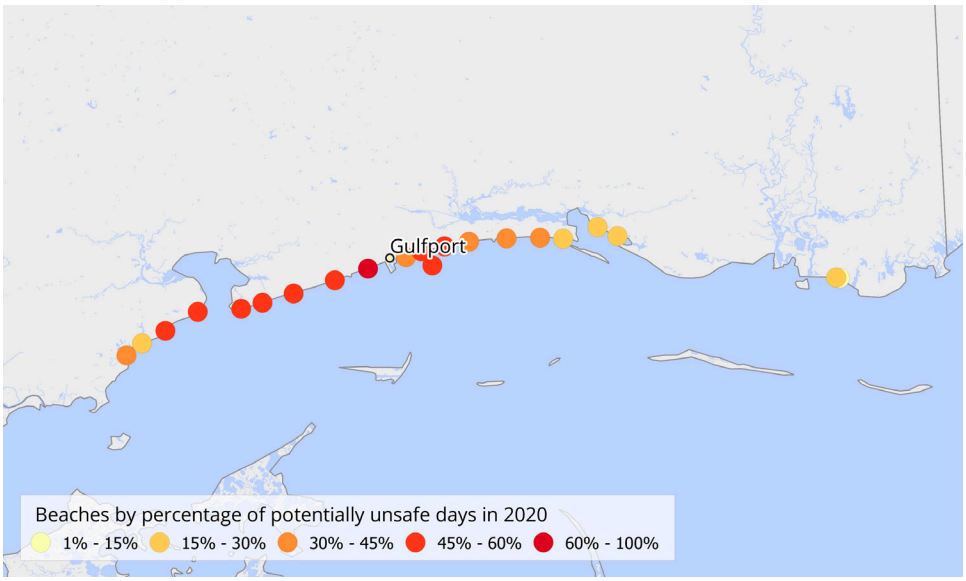
County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Cook County	7%	23
Lake County	7%	9
St. Louis County	6%	14

† Beach is under tribal jurisdiction.

Minnesota

In Minnesota, 23 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 46 beaches were tested for fecal indicator bacteria in Minnesota. At 23 of those beaches, testing found potentially unsafe water on at least one day, and two beaches were potentially unsafe on at least 25% of the days they were tested. Grand Portage Bay - Site 1 in Cook County tested as potentially unsafe for 10 days, more days than any other beach in the state, and 23% of the days that sampling took place. In Cook County, the average beach was potentially unsafe for swimming on 7% of the days that sampling took place, a higher percentage than any other county in the state.



Top beach sites by most potentially unsafe swimming days in Mississippi in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Gulfport West Beach	Harrison County	53	85	62%
Pass Christian Central Beach	Harrison County	47	79	59%
Pass Christian West Beach	Harrison County	40	71	56%
Gulfport Central Beach	Harrison County	36	68	53%
Waveland Beach	Hancock County	35	67	52%
Gulfport East Beach	Harrison County	34	66	52%
East Courthouse Road Beach	Harrison County	34	67	51%
Long Beach	Harrison County	32	68	47%
Bay St. Louis Beach	Hancock County	31	65	48%
Pass Christian East Beach	Harrison County	30	62	48%

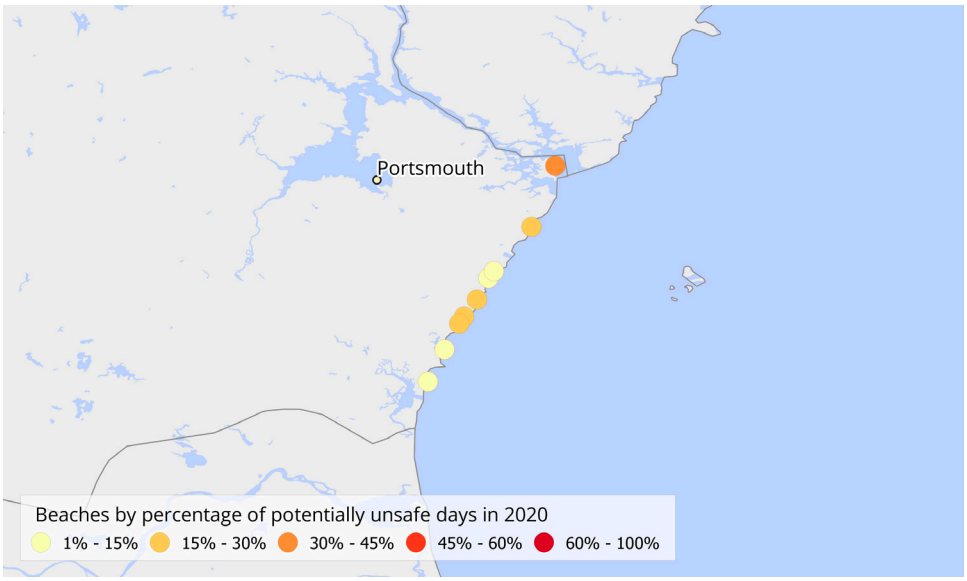
Average percentage of potentially unsafe days in Mississippi by county in 2020

County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Harrison County	46%	13
Hancock County	41%	4
Jackson County	22%	4

Mississippi

In Mississippi, 21 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 21 beaches were tested for fecal indicator bacteria in Mississippi. At all 21 of those beaches, testing found potentially unsafe water on at least one day, and 16 beaches were potentially unsafe on at least 25% of the days they were tested. Gulfport West Beach in Harrison County tested as potentially unsafe for 53 days, more days than any other beach in the state, and 62% of the days that sampling took place. In Harrison County, the average beach was potentially unsafe for swimming on 46% of the days that sampling took place, a higher percentage than any other county in the state.



Top beach sites by most potentially unsafe swimming days in New Hampshire in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
New Castle Town Beach*	Rockingham County	8	26	31%
North Hampton State Beach*	Rockingham County	8	30	27%
Wallis Sands Beach at Wallis Road*	Rockingham County	5	26	19%
Hampton Beach State Park*	Rockingham County	3	25	12%
Northside Park*	Rockingham County	2	7	29%
Bass Beach*	Rockingham County	1	6	17%
Jenness Beach at Cable Road*	Rockingham County	1	14	7%
North Beach*	Rockingham County	1	14	7%
Jenness State Beach*	Rockingham County	1	26	4%

Average percentage of potentially unsafe days in New Hampshire by county in 2020

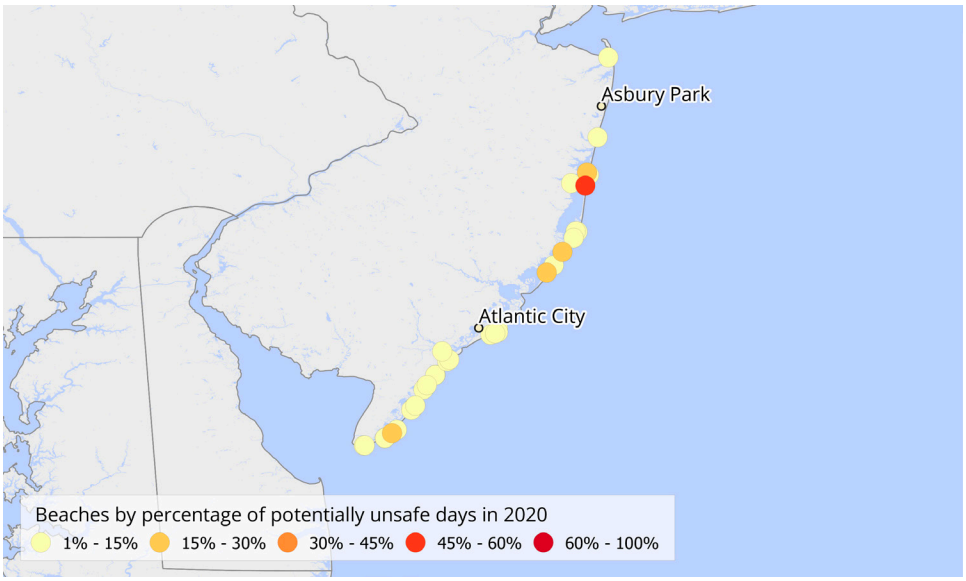
County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Rockingham County	10%	16

* Beach has more than one associated testing site, which may affect number of potentially unsafe days.

New Hampshire

In New Hampshire, nine tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 16 beaches were tested for fecal indicator bacteria in New Hampshire. At nine of those beaches, testing found potentially unsafe water on at least one day, and three beaches were potentially unsafe on at least 25% of the days they were tested. Two beaches – New Castle Town Beach in Rockingham County, and North Hampton State Beach in Rockingham County – tested as potentially unsafe for eight days, more than any other beaches in the state. In Rockingham County, the only county where testing took place in 2020, the average beach was potentially unsafe for swimming on 10% of the days that sampling took place.



Top beach sites by most potentially unsafe swimming days in New Jersey in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Seaside Park Borough at 5th Ave. Bay Front*	Ocean County	14	30	47%
Long Beach Township Bay Beach*	Ocean County	4	14	29%
Surf City Bay Beach*	Ocean County	4	17	24%
Wildwood City at Bennett Ave.*	Cape May County	3	18	17%
Brooklyn Ave. Bay Beach*	Ocean County	3	19	16%
Sea Isle City at 34th St.	Cape May County	2	17	12%
Cape May City at Congress*	Cape May County	2	18	11%
Atlantic City at St. James	Atlantic County	1	12	8%
Long Beach Township at Loveladies Lane	Ocean County	1	13	8%
Long Beach Township at Stockton*	Ocean County	1	14	7%

Average percentage of potentially unsafe days in New Jersey by county in 2020

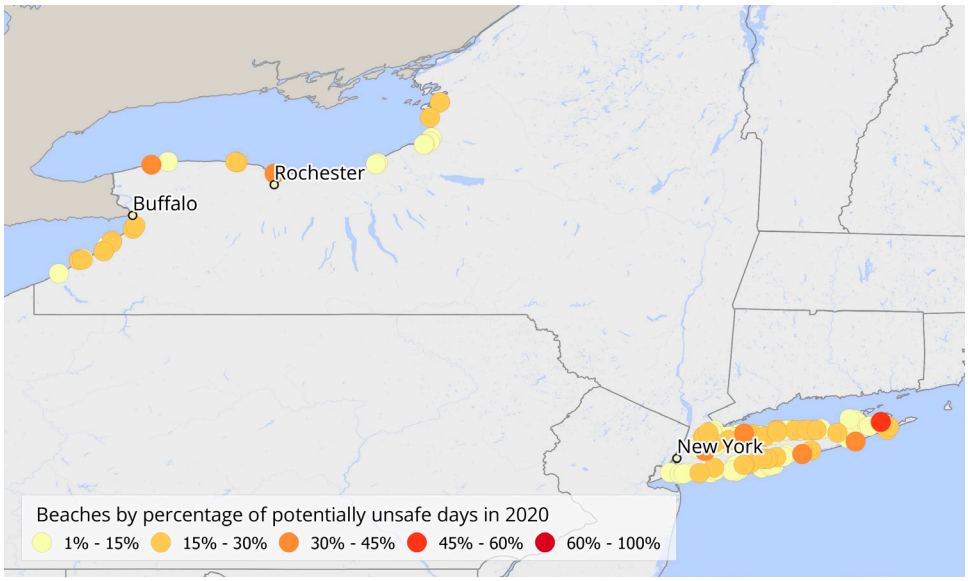
County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Ocean County	3%	56
Cape May County	2%	62
Atlantic County	1%	48
Monmouth County	0%	44

* Beach has more than one associated testing site, which may affect number of potentially unsafe days.

New Jersey

In New Jersey, 34 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 210 beaches were tested for fecal indicator bacteria in New Jersey. At 34 of those beaches, testing found potentially unsafe water on at least one day, and two beaches were potentially unsafe on at least 25% of the days they were tested. Seaside Park Borough at 5th Ave. Bay Front in Ocean County tested as potentially unsafe for 14 days, more days than any other beach in the state, and 47% of the days that sampling took place. In Ocean County, the average beach was potentially unsafe for swimming on 3% of the days that sampling took place, a higher percentage than any other county in the state.



New York

In New York, 172 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 340 beaches were tested for fecal indicator bacteria in New York. At 172 of those beaches, testing found potentially unsafe water on at least one day, and 15 beaches were potentially unsafe on at least 25% of the days they were tested. Ontario Beach in Monroe County tested as potentially unsafe for 34 days, more days than any other beach in the state, and 43% of the days that sampling took place. In Monroe County, the average beach was potentially unsafe for swimming on 24% of the days that sampling took place, a higher percentage than any other county in the state.

Top beach sites by most potentially unsafe swimming days in New York in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Ontario Beach*	Monroe County	34	79	43%
Woodlawn Beach State Park*	Erie County	30	109	28%
Valley Grove Beach	Suffolk County	23	54	43%
Hamburg Beach	Erie County	15	69	22%
Tanner Park	Suffolk County	11	47	23%
Benjamin's Beach	Suffolk County	10	43	23%
Venetian Shores	Suffolk County	10	45	22%
Hamlin Beach State Park	Monroe County	9	33	27%
Amityville Beach	Suffolk County	9	37	24%
Main Street Beach*	Chautauqua County	7	26	27%

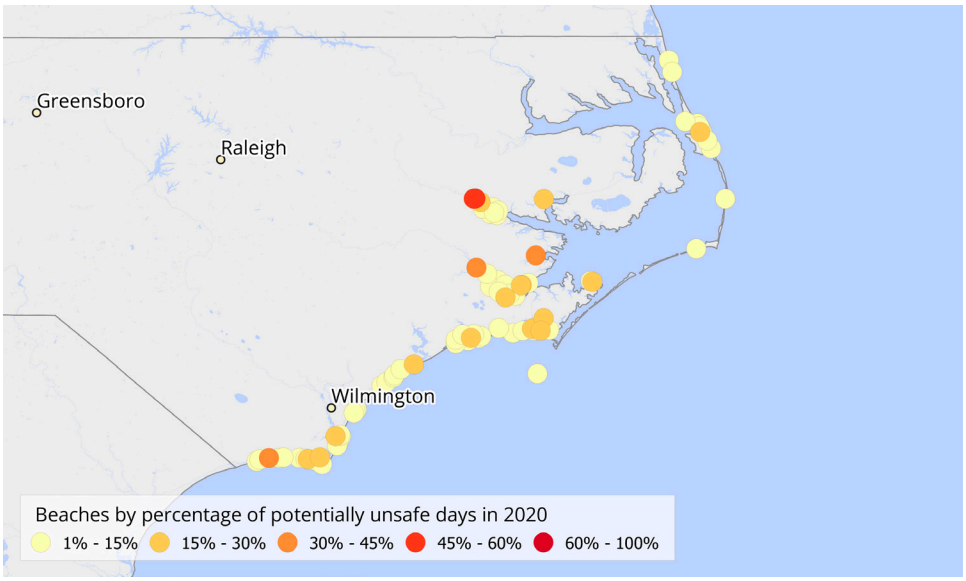
Average percentage of potentially unsafe days in New York by county in 2020

Table limited to counties with highest average percentage of potentially unsafe days.

County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Monroe County	24%	5
Niagara County	22%	2
Erie County	19%	5
Queens County	15%	5
Jefferson County	14%	3

County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Chautauqua County	14%	9
Suffolk County	7%	187
Westchester County	6%	23
Kings County	6%	6
Cayuga County	6%	2

* Beach has more than one associated testing site, which may affect number of potentially unsafe days.



North Carolina

In North Carolina, 87 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 210 beaches were tested for fecal indicator bacteria in North Carolina. At 87 of those beaches, testing found potentially unsafe water on at least one day, and seven beaches were potentially unsafe on at least 25% of the days they were tested. Pamlico River at the railroad trestle in Beaufort County tested as potentially unsafe for 10 days, more days than any other beach in the state, and 59% of the days that sampling took place. In Beaufort County, the average beach was potentially unsafe for swimming on 20% of the days that sampling took place, a higher percentage than any other county in the state.

Top beach sites by most potentially unsafe swimming days in North Carolina in 2020

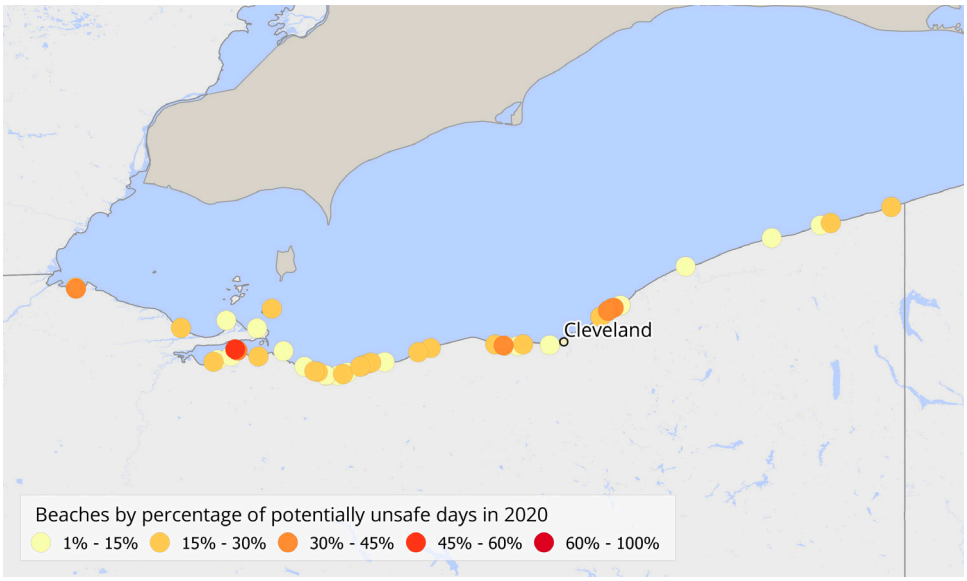
Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Pamlico River at the railroad trestle	Beaufort County	10	17	59%
Pamlico River at Havens Gardens Park	Beaufort County	9	19	47%
Holden Beach	Brunswick County	7	17	41%
Beach by Vandemere Creek	Pamlico County	7	19	37%
Jockey's Ridge Beach	Dare County	7	30	23%
Beach at Pantego Creek	Beaufort County	7	32	22%
Beach at Union Point	Craven County	5	16	31%
Carolina Beach	New Hanover County	5	18	28%
Hancock Creek	Craven County	4	15	27%
Lennoxville Boat Ramp in Beaufort	Carteret County	4	17	24%

Average percentage of potentially unsafe days in North Carolina by county in 2020

Table limited to counties with highest average percentage of potentially unsafe days.

County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Beaufort County	20%	10
Craven County	15%	7
Pamlico County	11%	9
Onslow County	4%	14
Pender County	4%	7

County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Carteret County	4%	54
New Hanover County	3%	22
Brunswick County	3%	38
Dare County	2%	40
Currituck County	1%	5



Top beach sites by most potentially unsafe swimming days in Ohio in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Bay View West	Erie County	36	76	47%
Bay View East	Erie County	27	77	35%
Villa Angela State Park	Cuyahoga County	27	112	24%
Maumee Bay Inland Beach	Lucas County	21	51	41%
Lake Front Park	Erie County	21	76	28%
Huntington Beach	Cuyahoga County	21	109	19%
Euclid State Park	Cuyahoga County	20	113	18%
Lagoons Beach	Erie County	19	78	24%
Sherod Park Beach	Erie County	18	78	23%
Main Street Beach	Erie County	16	78	21%

Average percentage of potentially unsafe days in Ohio by county in 2020

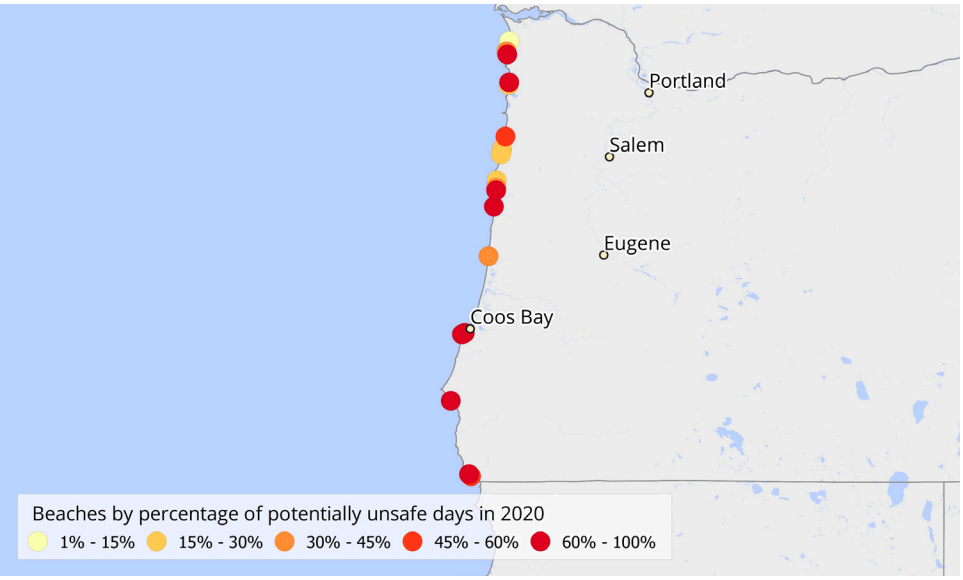
Note that some counties only had monitoring data for one beach in 2020.

County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Lucas County	33%	2
Lorain County	24%	2
Cuyahoga County	20%	17
Erie County	16%	22
Ashtabula County	16%	4
Ottawa County	11%	6
Lake County	5%	1

Ohio

In Ohio, 49 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 54 beaches were tested for fecal indicator bacteria in Ohio. At 49 of those beaches, testing found potentially unsafe water on at least one day, and 14 beaches were potentially unsafe on at least 25% of the days they were tested. Bay View West in Erie County tested as potentially unsafe for 36 days, more days than any other beach in the state, and 47% of the days that sampling took place. In Lucas County, the average beach was potentially unsafe for swimming on 33% of the days that sampling took place, a higher percentage than any other county in the state.



Top beach sites by most potentially unsafe swimming days in Oregon in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Nye Beach*	Lincoln County	9	10	90%
Seal Rock State Recreation Site*	Lincoln County	7	10	70%
Sunset Bay State Park*	Coos County	6	7	86%
Bastendorf Beach*	Coos County	5	6	83%
Harris Beach State Park*	Curry County	5	6	83%
Rockaway Beach*	Tillamook County	5	6	83%
Tolovana Beach State Wayside*	Clatsop County	5	7	71%
Hubbard Creek Beach at Humbug Mountain State Park*	Curry County	4	6	67%
Cannon Beach*	Clatsop County	4	9	44%
Mill Beach*	Curry County	3	6	50%
Neskowin Beach State Wayside*	Tillamook County	3	6	50%

Average percentage of potentially unsafe days in Oregon by county in 2020

Note that some counties only had monitoring data for one beach in 2020.

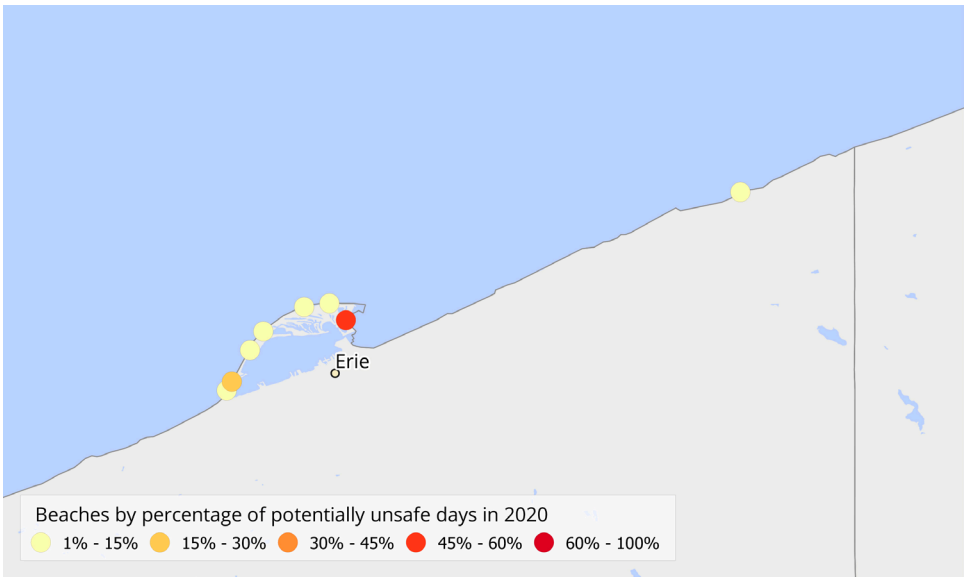
County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Coos County	85%	2
Curry County	67%	3
Lincoln County	43%	6
Clatsop County	42%	3
Tillamook County	38%	4
Lane County	33%	1

* Beach has more than one associated testing site, which may affect number of potentially unsafe days.

Oregon

In Oregon, 18 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 19 beaches were tested for fecal indicator bacteria in Oregon. At 18 of those beaches, testing found potentially unsafe water on at least one day, and 14 beaches were potentially unsafe on at least 25% of the days they were tested. Nye Beach in Lincoln County tested as potentially unsafe for nine days, more days than any other beach in the state, and 90% of the days that sampling took place. In Coos County, the average beach was potentially unsafe for swimming on 85% of the days that sampling took place, a higher percentage than any other county in the state.



Top beach sites by most potentially unsafe swimming days in Pennsylvania in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Erie Beach 11*	Erie County	11	24	46%
Barracks Beach*	Erie County	8	30	27%
Erie Beach 6*	Erie County	4	28	14%
Erie Beach 9 (Pine Tree Beach)*	Erie County	3	24	12%
Erie Beach 1 East*	Erie County	2	24	8%
Erie Beach 8 (Pettinato Beach)*	Erie County	2	28	7%
Freeport Beach*	Erie County	1	13	8%
Erie Beach 10 (Bundy Beach)*	Erie County	1	26	4%

Average percentage of potentially unsafe days in Pennsylvania by county in 2020

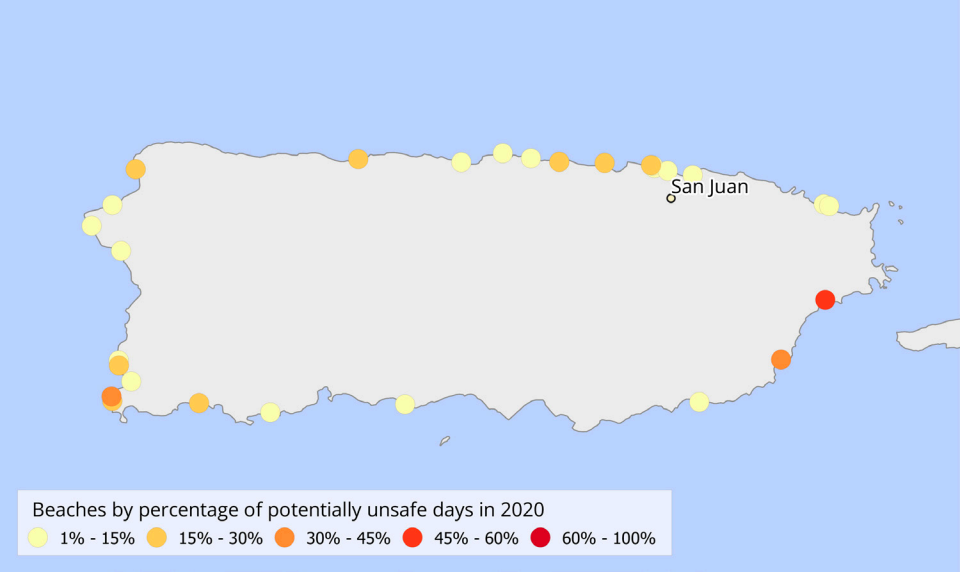
County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Erie County	16%	8

* Beach has more than one associated testing site, which may affect number of potentially unsafe days.

Pennsylvania

In Pennsylvania, eight tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, eight beaches were tested for fecal indicator bacteria in Pennsylvania. At all eight of those beaches, testing found potentially unsafe water on at least one day, and two beaches were potentially unsafe on at least 25% of the days they were tested. Erie Beach 11 in Erie County tested as potentially unsafe for 11 days, more days than any other beach in the state, and 46% of the days that sampling took place. In Erie County, the only county where testing took place in 2020, the average beach was potentially unsafe for swimming on 16% of the days that sampling took place.



Puerto Rico

In Puerto Rico, 28 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 34 beaches were tested for fecal indicator bacteria in Puerto Rico. At 28 of those beaches, testing found potentially unsafe water on at least one day, and five beaches were potentially unsafe on at least 25% of the days they were tested. Tropical Beach in Naguabo Municipio tested as potentially unsafe for 11 days, more days than any other beach in the territory, and 55% of the days that sampling took place. In Naguabo Municipio (with just one monitored beach in 2020), the average beach was potentially unsafe for swimming on 55% of the days that sampling took place, a higher percentage than any other municipio in the territory.

Top beach sites by most potentially unsafe swimming days in Puerto Rico in 2020

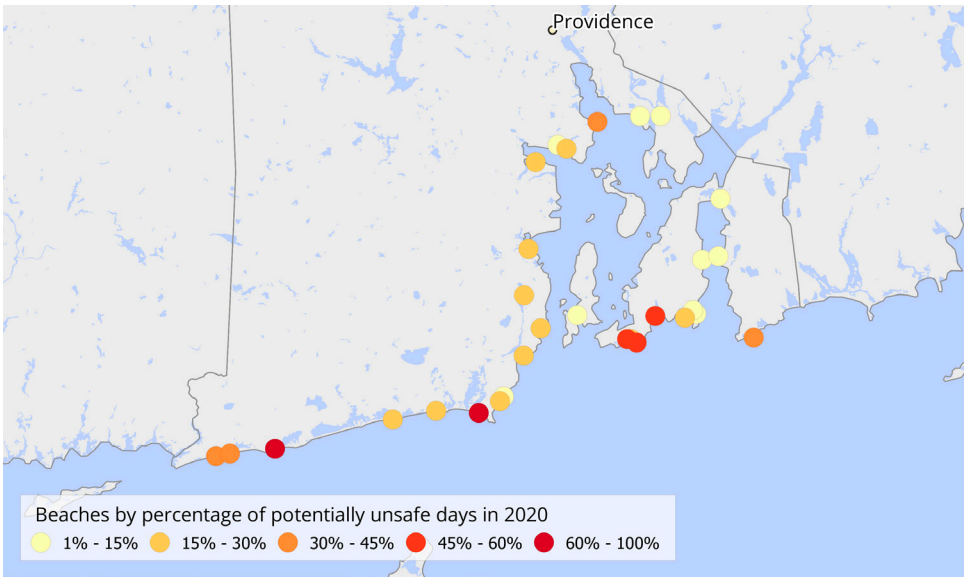
Beach name	Municipio	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Tropical Beach	Naguabo Municipio	11	20	55%
Playa Mojacasabe	Cabo Rojo Municipio	7	20	35%
Playa Guayanes	Yabucoa Municipio	6	19	32%
Balneario Sardinera	Dorado Municipio	5	18	28%
Muelle de Arecibo	Arecibo Municipio	5	18	28%
Balneario Crash Boat Beach	Aguadilla Municipio	4	17	24%
Playa El Combate	Cabo Rojo Municipio	4	17	24%
Balneario El Escambron	San Juan Municipio	4	19	21%
Playa Buye	Cabo Rojo Municipio	4	20	20%
Playita Rosada, Lajas	Lajas Municipio	3	14	21%

Average percentage of potentially unsafe days in Puerto Rico by municipio in 2020

Table limited to municipios with highest average percentage of potentially unsafe days. Note that some municipios only had monitoring data for one beach in 2020.

Municipio	Average percentage of days with potentially unsafe water for beaches in municipio	Number of tested beaches
Naguabo Municipio	55%	1
Yabucoa Municipio	32%	1
Arecibo Municipio	28%	1
Aguadilla Municipio	24%	1
Lajas Municipio	21%	1

Municipio	Average percentage of days with potentially unsafe water for beaches in municipio	Number of tested beaches
Cabo Rojo Municipio	19%	5
Dorado Municipio	17%	2
Toa Baja Municipio	17%	1
Añasco Municipio	12%	1
Patillas Municipio	12%	1



Top beach sites by most potentially unsafe swimming days in Rhode Island in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Easton's Beach*	Newport County	16	29	55%
Conimicut Point Beach*	Kent County	9	29	31%
Oakland Beach*	Kent County	7	29	24%
Hazard's Beach*	Newport County	6	13	46%
Scarborough State Beach South*	Washington County	6	29	21%
Goddard Memorial State Park*	Kent County	5	29	17%
Roger Wheeler State Beach*	Washington County	4	6	67%
Scarborough State Beach North*	Washington County	4	29	14%
Warren Town Beach	Bristol County	4	29	14%
Bailey Beach*	Newport County	3	6	50%

Average percentage of potentially unsafe days in Rhode Island by county in 2020

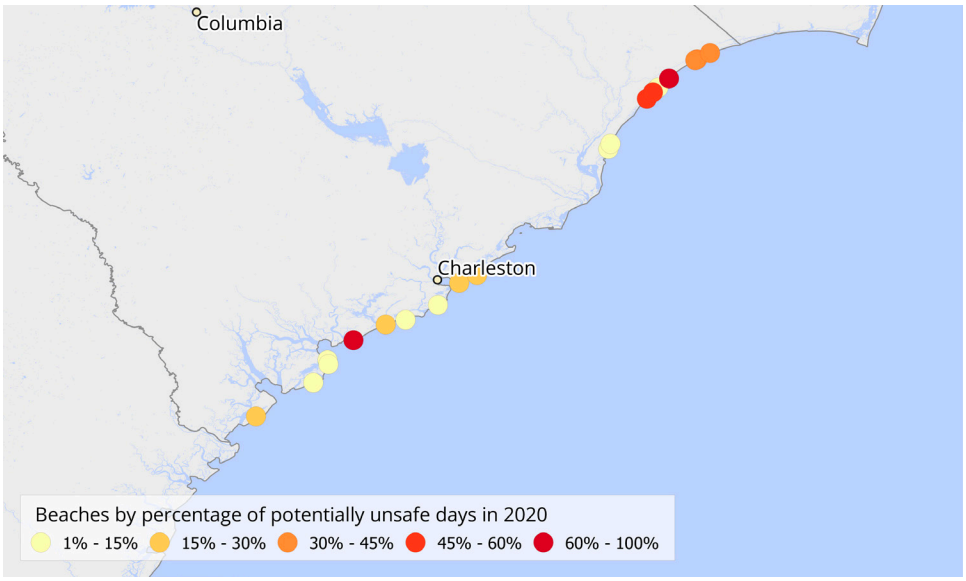
County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Kent County	21%	4
Newport County	17%	17
Washington County	9%	41
Bristol County	7%	3

* Beach has more than one associated testing site, which may affect number of potentially unsafe days.

Rhode Island

In Rhode Island, 30 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 65 beaches were tested for fecal indicator bacteria in Rhode Island. At 30 of those beaches, testing found potentially unsafe water on at least one day, and 13 beaches were potentially unsafe on at least 25% of the days they were tested. Easton's Beach in Newport County tested as potentially unsafe for 16 days, more days than any other beach in the state, and 55% of the days that sampling took place. In Kent County, the average beach was potentially unsafe for swimming on 21% of the days that sampling took place, a higher percentage than any other county in the state.



Top beach sites by most potentially unsafe swimming days in South Carolina in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Myrtle Beach*	Horry County	70	82	85%
North Myrtle Beach*	Horry County	29	87	33%
Briarcliffe Acres Beach*	Horry County	24	74	32%
Beach at Horry County Campgrounds*	Horry County	16	28	57%
Surfside Beach*	Horry County	15	30	50%
Arcadia Beach*	Horry County	9	27	33%
Edisto Island*	Charleston County	7	11	64%
Hilton Head Island*	Beaufort County	2	10	20%
Isle of Palms*	Charleston County	2	10	20%
Seabrook Island*	Charleston County	2	10	20%

Average percentage of potentially unsafe days in South Carolina by county in 2020

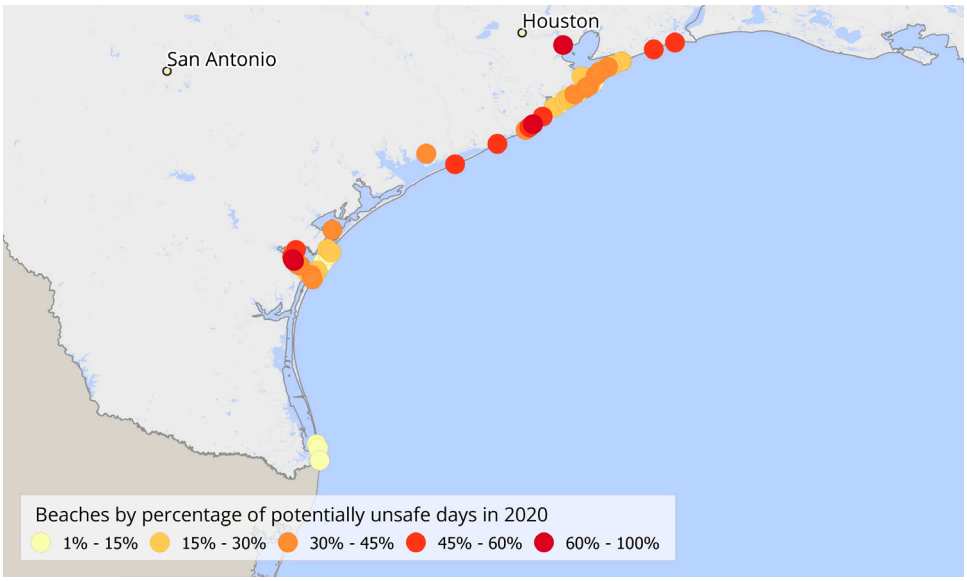
County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Horry County	34%	9
Charleston County	23%	6
Beaufort County	12%	4
Georgetown County	5%	4

* Beach has more than one associated testing site, which may affect number of potentially unsafe days.

South Carolina

In South Carolina, 20 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 23 beaches were tested for fecal indicator bacteria in South Carolina. At 20 of those beaches, testing found potentially unsafe water on at least one day, and seven beaches were potentially unsafe on at least 25% of the days they were tested. Myrtle Beach in Horry County tested as potentially unsafe for 70 days, more days than any other beach in the state, and 85% of the days that sampling took place. In Horry County, the average beach was potentially unsafe for swimming on 34% of the days that sampling took place, a higher percentage than any other county in the state.



Top beach sites by most potentially unsafe swimming days in Texas in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Cole Park*	Nueces County	62	68	91%
Ropes Park*	Nueces County	40	54	74%
Surfside Beach*	Brazoria County	34	47	72%
Sylvan Beach Park*	Harris County	27	44	61%
Follet's Island*	Brazoria County	25	44	57%
Corpus Christi Marina*	Nueces County	23	40	57%
Quintana Beach*	Brazoria County	23	43	53%
Sargent Beach*	Matagorda County	20	40	50%
Jetty Park*	Matagorda County	20	43	47%
Nueces Bay Causeway #3	San Patricio County	18	38	47%

Average percentage of potentially unsafe days in Texas by county in 2020

Note that some counties only had monitoring data for one beach in 2020.

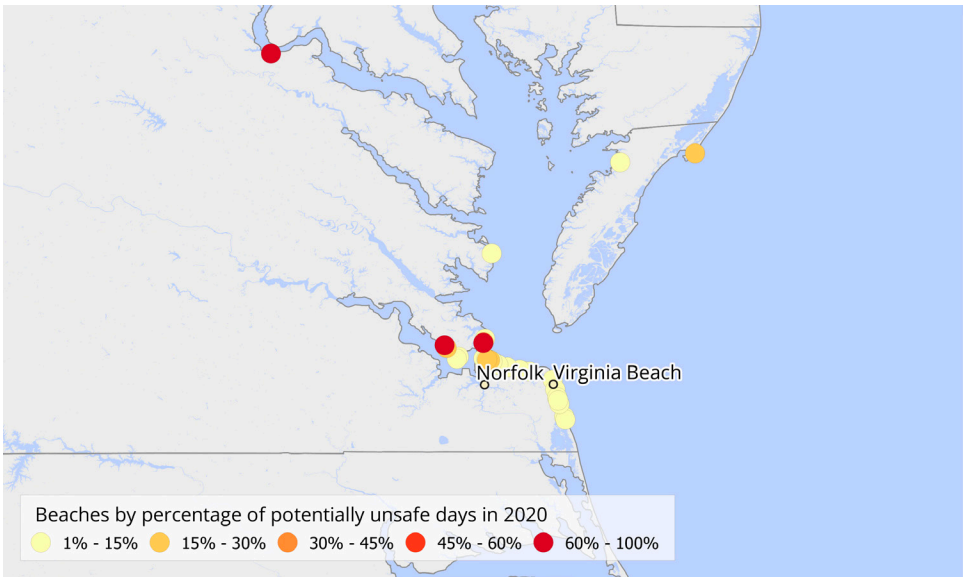
County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Harris County	61%	1
Brazoria County	56%	4
Jefferson County	53%	2
San Patricio County	47%	1
Matagorda County	45%	3
Nueces County	34%	17
Aransas County	31%	1
Galveston County	22%	23
Cameron County	3%	9

Texas

In Texas, 55 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 61 beaches were tested for fecal indicator bacteria in Texas. At 55 of those beaches, testing found potentially unsafe water on at least one day, and 31 beaches were potentially unsafe on at least 25% of the days they were tested. Cole Park in Nueces County tested as potentially unsafe for 62 days, more days than any other beach in the state, and 91% of the days that sampling took place. In Harris County (with just one monitored beach in 2020), the average beach was potentially unsafe for swimming on 61% of the days that sampling took place, a higher percentage than any other county in the state.

* Beach has more than one associated testing site, which may affect number of potentially unsafe days.



Virginia

In Virginia, 29 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 49 beaches were tested for fecal indicator bacteria in Virginia. At 29 of those beaches, testing found potentially unsafe water on at least one day, and four beaches were potentially unsafe on at least 25% of the days they were tested. Hilton Beach in Newport News city tested as potentially unsafe for 10 days, more days than any other beach in the state, and 71% of the days that sampling took place. In King George County (with just one monitored beach in 2020), the average beach was potentially unsafe for swimming on 89% of the days that sampling took place, a higher percentage than any other county or independent city in the state.

Top beach sites by most potentially unsafe swimming days in Virginia in 2020

Beach name	County/ independent city	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Hilton Beach	Newport News city	10	14	71%
Fairview Beach	King George County	8	9	89%
Buckroe Beach	Hampton city	4	12	33%
Assateague Virginia*	Accomack County	3	15	20%
Huntington Beach	Newport News city	3	15	20%
Captains Quarters	Norfolk city	3	18	17%
Sarah Constant Beach Park, East End	Norfolk city	3	18	17%
Guard Shore	Accomack County	2	14	14%
King/Lincoln Park	Newport News city	2	15	13%
Beach at 10th View	Norfolk city	2	18	11%
Beach at 13th View	Norfolk city	2	18	11%
Ocean View Park	Norfolk city	2	18	11%

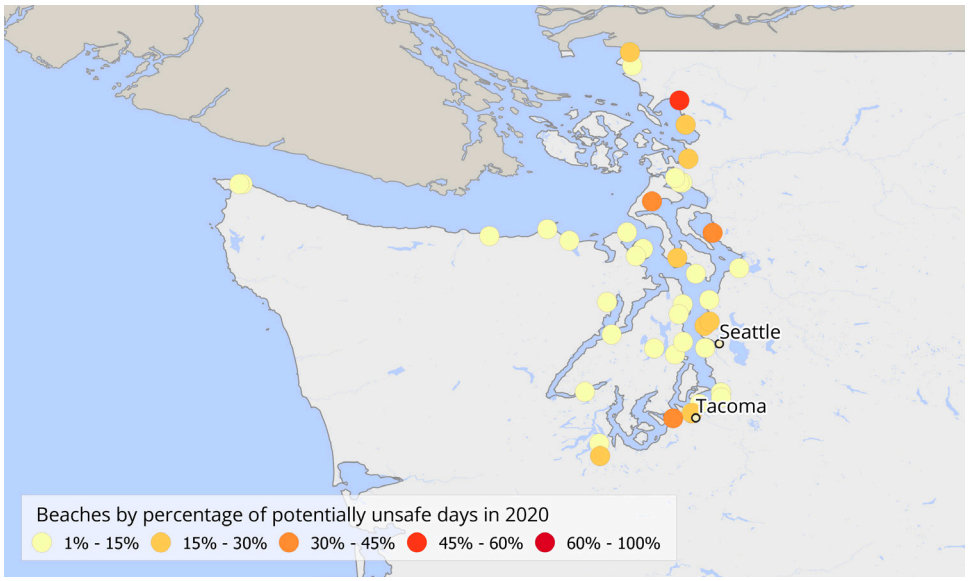
Average percentage of potentially unsafe days in Virginia by county/independent city in 2020

Table limited to counties with highest average percentage of potentially unsafe days. Note that some counties only had monitoring data for one beach in 2020.

County/ independent city	Average percentage of days with potentially unsafe water for beaches in county/ independent city	Number of tested beaches
King George County	89%	1
Hampton city	28%	5
Newport News city	28%	4
Accomack County	17%	2

County/ independent city	Average percentage of days with potentially unsafe water for beaches in county/ independent city	Number of tested beaches
Norfolk city	8%	10
Mathews County	8%	1
Virginia Beach city	2%	22
Virginia Beach	2%	22

* Beach has more than one associated testing site, which may affect number of potentially unsafe days.



Top beach sites by most potentially unsafe swimming days in Washington in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
Little Squalicum Park*	Whatcom County	8	14	57%
Kayak Point County Park*	Snohomish County	5	14	36%
Titlow Park*	Pierce County	5	14	36%
Windjammer Lagoon*	Island County	5	14	36%
Freeland Park*	Island County	4	14	29%
Wildcat Cove*	Whatcom County	3	10	30%
Jack Hyde Park*	Pierce County	3	14	21%
Priest Point Park*	Thurston County	3	14	21%
Carkeek Park*	King County	2	9	22%
Golden Gardens*	King County	2	10	20%

Average percentage of potentially unsafe days in Washington by county in 2020

Table limited to counties with highest average percentage of potentially unsafe days.

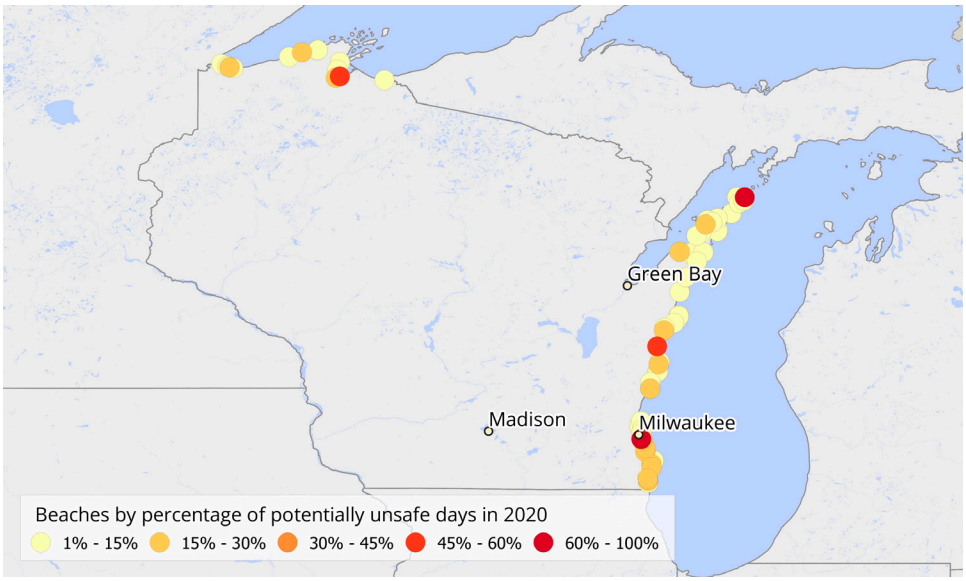
County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Island County	26%	3
Whatcom County	23%	5
Thurston County	14%	2
Jefferson County	11%	4
Snohomish County	10%	6
Pierce County	9%	9
King County	7%	10
Clallam County	6%	10
Skagit County	5%	7
Kitsap County	5%	12

Washington

In Washington, 41 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 74 beaches were tested for fecal indicator bacteria in Washington. At 41 of those beaches, testing found potentially unsafe water on at least one day, and six beaches were potentially unsafe on at least 25% of the days they were tested. Little Squalicum Park in Whatcom County tested as potentially unsafe for eight days, more days than any other beach in the state, and 57% of the days that sampling took place. In Island County, the average beach was potentially unsafe for swimming on 26% of the days that sampling took place, a higher percentage than any other county in the state.

* Beach has more than one associated testing site, which may affect number of potentially unsafe days.



Top beach sites by most potentially unsafe swimming days in Wisconsin in 2020

Beach name	County	Potentially unsafe days in 2020	Days with testing	Percentage of testing days with potentially unsafe water
South Shore Beach	Milwaukee County	30	40	75%
Kreher Park Beach	Ashland County	15	30	50%
Fish Creek Beach	Door County	13	65	20%
Zoo Beach*	Racine County	12	68	18%
Pennoyer Park Beach	Kenosha County	10	34	29%
Red Arrow Park Beach Manitowoc	Manitowoc County	9	50	18%
Simmons Island Beach	Kenosha County	8	42	19%
North Beach*	Racine County	8	67	12%
Hika Park Bay	Manitowoc County	7	15	47%
6th Ave. W. Beach	Ashland County	7	30	23%
Maslowski Beaches*	Ashland County	7	30	23%

Wisconsin

In Wisconsin, 70 tested beaches were potentially unsafe for swimming on at least one day in 2020.

In 2020, 96 beaches were tested for fecal indicator bacteria in Wisconsin. At 70 of those beaches, testing found potentially unsafe water on at least one day, and seven beaches were potentially unsafe on at least 25% of the days they were tested. South Shore Beach in Milwaukee County tested as potentially unsafe for 30 days, more days than any other beach in the state, and 75% of the days that sampling took place. In Ashland County, the average beach was potentially unsafe for swimming on 24% of the days that sampling took place, a higher percentage than any other county in the state.

Average percentage of potentially unsafe days in Wisconsin by county in 2020

Table limited to counties with highest average percentage of potentially unsafe days.

County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Ashland County	24%	4
Kenosha County	16%	5
Milwaukee County	16%	10
Racine County	15%	5
Kewaunee County	10%	2

County	Average percentage of days with potentially unsafe water for beaches in county	Number of tested beaches
Douglas County	10%	6
Ozaukee County	9%	3
Manitowoc County	9%	10
Door County	8%	29
Bayfield County	6%	11

* Beach has more than one associated testing site, which may affect number of potentially unsafe days.

Conclusion and policy recommendations

No matter where they live, Americans should be able to enjoy beaches that are clean and safe for swimming. Too often, however, the water at our beaches presents risks to public health.

The good news is that, with the right resources, communities can keep beaches safe for everyone to enjoy – and many have done just that. In every corner of the country, communities have taken action to protect their waters from urban runoff, agricultural waste and sewage. They have done so both by preventing pollution at its source and by making improvements near swimming areas such as fixing or greening their water infrastructure.[69]

There are a wide variety of solutions available for protecting the health of our beaches, and different actions make sense for different regions and different pollution threats. Policymakers at every level of government should consider actions including the following:

Prevent urban runoff pollution.

- Dramatically increase public investment in natural and green infrastructure features – such as rain barrels, permeable pavement, urban green space and green roofs – that prevent bacteria-laden pollution from reaching waterways.
- Require the use of green infrastructure in new development/redevelopment and use additional policy tools to promote its use at existing developments.
- Protect and restore natural infrastructure, including riparian areas and wetlands that can filter bacteria, sediment and nutrients.

Prevent sewage pollution.

- Dramatically increase public investment in fixing aging sewage systems.
- Expand the use of green infrastructure to prevent sewage overflows and runoff pollution.
- Enforce pollution limits for sewage treatment plants, and review permits every five years to address threats to health and the environment, as required by the Clean Water Act.
- Upgrade wastewater facilities that are in danger of overflowing during storms and floods.
- Ensure more frequent inspections and proper maintenance of residential septic systems.

Prevent manure pollution.

- Enact moratoriums on new or expanded industrial-scale livestock operations, especially in watersheds already overburdened by manure pollution.
- Ban livestock waste lagoons, especially in flood-prone areas.
- Enact policies to stop manure from factory farms from flowing into waterways upstream from our beaches.
- Encourage livestock operations to raise animals on rotational pasture.

Policymakers should also take actions to **provide beachgoers with the information they need to stay safe**, including the following:

- Use EPA's most protective "Beach Action Value" bacteria standard for posting beach advisories.
- Put in place systems for same-day water testing and warnings, particularly during times of heavy water recreation.[70]
- Increase funding for beach monitoring to ensure that state, tribal and local agencies have adequate resources to conduct testing at beaches used for recreation.

Finally, federal policymakers should ensure that the Clean Water Act protects all waterways upstream from the places we swim, including wetlands that help filter out pollutants. This must start with EPA immediately repealing the 2020 rule that leaves more than half the nation's wetlands and thousands of streams without federal protection from pollution or development.[71]

Methodology

National beach fecal indicator bacteria testing data was downloaded from the National Water Quality Monitoring Council's Water Quality Portal (WQP) on 11 May 2021.[72] This analysis includes water quality data at all beaches listed under the BEACH Act located in U.S. states (except for Alaska) and Puerto Rico for which 2020 testing data was available.[73] Some beaches included in this analysis are now considered "historical" BEACH Act beaches, and are monitored under separate programs. As of May 2021, EPA's Beach Advisory and Closing Online Notification data portal (BEACON) marked the status of 17 states and tribes as either "verifying" or "submitting" their data.[74] Water quality data may change as those states complete their data submission processes.

Data for Chicago beaches (but not other Illinois beaches) was downloaded from an alternate source, the City of Chicago's data portal.[75] Chicago beach sample results were taken from the data field "DNA Reading Mean."

Beach sites were considered "potentially unsafe" if sample results exceeded the EPA Beach Action Value (BAV) associated with an estimated illness rate of 32 per 1,000 swimmers.[76] The EPA suggests states use BAVs "as a conservative, precautionary tool for making beach notification decisions."[77] As most states use different criteria for assessing beach safety, the results presented in this report may differ from state agency reports on beach water quality. The following BAVs were used for assessing beach safety:

- For enterococcus, the BAV is 60 colony-forming units per 100 milliliters (cfu/100mL), for both marine and fresh water.
- For *E. coli* the BAV is 190 cfu/100mL, for fresh water only.
- For enterococcus tests conducted using a quantitative polymerase chain reaction (qPCR) method, with results reported as calibrator cell equivalent (cce) per 100mL, the BAV is 640 cce/100mL, for both marine and fresh water. The only reviewed qPCR enterococcus samples were for the beaches in the City of Chicago.

Tests for which there is no applicable BAV were not considered for this analysis. For 2020, the only such tests not considered were *E. coli* tests of marine waters, which took place in California.[78] California beaches for which *E. coli* tests were not considered are marked in California's state information table.

Bacteria tests were grouped together by day to determine "potentially unsafe days." If multiple tests occurred on a single day, and one of those tests exceeded the safe limit for bacteria, that day was considered a "potentially unsafe day." State tables of beach sites generally include the 10 beaches with the most potentially unsafe days, ordered by most to fewest. Tables are secondarily ordered by fewest to most days with testing.

The average percentage of potentially unsafe days by county was calculated by averaging percentages of potentially unsafe sampling days for all beaches within each county (as opposed to dividing the total number of unsafe beach days by total sampling days in the county). In states with data for more than 10 counties, county tables were limited to the top counties as ranked by average percentage of potentially unsafe days.

Some data cleanup and categorization were performed before conducting analysis and mapping:

- Water quality data was linked to beach attribute data, such as beach name and location, using each water sample's associated "Beach ID." In the WQP, Beach IDs are listed under the attribute ProjectIdentifier. Beach attribute data was obtained through BEACON.[79] Beach names were cleaned and formatted based on information from BEACON. In some cases in which beach names were unavailable through BEACON, beach names were assigned based on internet searches for the beach or beach latitude/longitude.
- Location data for displaying beach sites on maps come from two sources. The majority of beach locations were based on the midpoint of start and end points contained in the beach attributes available through BEACON.[80] For beaches where such information was either not available or was obviously incorrect, beach location was obtained for the beach's affiliated sampling site from the National Water Quality Monitoring Council's *Water Quality Portal*.[81] Because of the nature of the geotagging process, sample sites displayed on maps may occasionally reflect imprecise locations.
- For regional aggregations, most beaches were assigned to regions based on their state. New York and Florida both contain sample sites grouped to two different regions: New York has sample sites in the Great Lakes and the East Coast, and Florida has sample sites in the Gulf and the East Coast. Those beaches were assigned based on their BEACON "Waterbody Name" attribute.

In addition to each to each sample's recorded measurement, other information in the WQP had the potential to affect how samples were treated in this analysis:

- Samples with parameter ResultDetectionConditionText of "Present Above Quantification Limit" were assumed to have a bacteria count equal to that test record's quantification limit, from the field "DetectionQuantitationLimitMeasure/MeasureValue."
- Measure values recorded as "less than" a specific number value (indicated with a "<" symbol) were treated as safe samples. Measure values indicated as "more than" a value (indicated with a ">" symbol) were treated as the value that followed the symbol.
- Measurements for which the parameter "ResultMeasure/MeasureUnitCode" was not specified were assumed to be reported in concentrations per 100 milliliters (as opposed to calibrator cell equivalents reported for the still-rarely-used quantitative polymerase chain reaction tests).
- Sample results were not considered if comment text indicated a problem with the test, including "sample results inconclusive."
- Sample results were not considered if parameter "StatisticalBaseCode" was recorded as a "30-day Geometric Mean" test, as multi-day tests cannot be used to determine beach safety for specific days.
- Samples recorded as a "geometric mean" were assessed against the BAV single sample threshold, as exceedance of the geometric mean implies that at least one sample exceeded the single-sample threshold.

Notes

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61 See note 53; marine vegetation and bacteria: Gregory Imamura et al., "Wrack promotes the persistence of fecal indicator bacteria in marine sands and seawater," *FEMS Microbiology Ecology*, July 2011, doi: 10.1111/j.1574-6941.2011.01082.x.

62 See note 2.

63 Chicago data was obtained from the City of Chicago, not the Water Quality Portal. See Methodology for details.

64 See note 2.

65 See, for example, Wisconsin's bacteria testing protocol: Wisconsin Department of Natural Resources, *Beach Monitoring Program Requirements*, date unknown, archived on 20 February 2017 at http://web.archive.org/web/20170220183426/http://dnr.wi.gov/topic/Beaches/documents/BeachMonitoringRequirements.pdf.

66 Such as Hawaii. See section "Response to Brown Water Advisories" in: Hawaii State Department of Health, *Hawaii Beach Monitoring Program*, 1 September 2020, archived at https://web.archive.org/web/20210602162015/https://health.hawaii.gov/cwb/files/2020/09/Hawaii-Beach-Monitoring-Program-FINAL_9-1-20.pdf.

67 U.S. Environmental Protection Agency, *BEACON 2.0 - Beach Monitoring Frequency report*, downloaded 1 July 2020 from https://watersgeo.epa.gov/BEACON2/reports.html.

68 12 beaches with at least 10 test sites were assessed, not all of which are included in state tables. In California: Newport Bay, Laguna Beach, San Clemente City Beach, Huntington Harbour, Dana Point Harbor, Aliso County Beach, Doheny State Beach, and Newport Beach; and in South Carolina: Hilton Head Island, Edisto Island, Myrtle Beach, and North Myrtle Beach.

69 Laura Miller and John Rumpler, Environment America Research & Policy Center, *A Path to Cleaner Water*, December 2020, archived at https://web.archive.org/web/20210512202350/https://environmenttexascenter.org/sites/environment/files/reports/TXE%20Clean%20Water%20Report%20Nov20_web.pdf; also see chapter "With resources, communities can make beaches safe" from: Gideon Weissman, Frontier Group, and John Rumpler, Environment America Research & Policy Center, *Safe for Swimming 2020 Edition*, July 2020, archived at http://web.archive.org/web/20201030052923/https://frontiergroup.org/sites/default/files/reports/AME%20Safe%20for%20Swimming%20Report%20Jul20_web.pdf.

70 See note 16.

71 Rule: U.S. Environmental Protection Agency, *Final Rule: Navigable Waters Protection Rule*, 21 April 2020, available at https://www.epa.gov/nwpr/final-rule-navigable-waters-protection-rule#:~:text=Congress%2C%20in%20the%20Clean%20Water,or%20intermittent%20flow%20into%20them.; analysis: Natural Resources Defense Council, *NRDC and Partners Sue to Stop the Dirty Water Rule*, 29 April 2020, archived at http://web.archive.org/web/20200604090337/https://www.nrdc.org/experts/jon-devine/nrdc-and-partners-sue-stop-dirty-water-rule.

72 Sampling data was downloaded for all test results where result parameter CharacteristicName was equal to Enterococcus or *Escherichia coli,* for the year 2020. National Water Quality Monitoring Council, *Water Quality Data*, downloaded from https://www.waterqualitydata.us/portal/ on 11 May 2021.

73 Specifically, samples were included if they had a "Beach ID" matching a beach in the BEACON system, and if that Beach ID matched a beach that was marked as a BEACH Act Beach in the *Beach Profile* report available through BEACON at https://watersgeo.epa.gov/beacon2/reports.html.

74 U.S. Environmental Protection Agency, *State, Territorial, Tribal and EPA Beach Program Contacts*, accessed at https://www.epa.gov/beaches/state-territorial-tribal-and-epa-beach-program-contacts on 11 May 2021. As of May 2021 the following were marked as "submitting": California, Florida and Hawaii; and the following were marked as "verifying": Bad River Band Tribe, Delaware, Georgia, Illinois, Indiana, Maine, Michigan, Minnesota, Mississippi, Oregon, Puerto Rico, Rhode Island, Swinomish Tribe, and Texas.

75 City of Chicago Data Portal, *Beach Lab Data - DNA Tests*, downloaded 6 May 2021 from https://data.cityofchicago.org/Parks-Recreation/Beach-Lab-Data-DNA-Tests/hmqm-anjq.

76 See note 2.

77 Ibid.

78 Previous editions of this report excluded qPCR *E. Coli* testing in Racine County, Wisconsin, for which there is no Beach Action Value. In 2020, due to circumstances surrounding the COVID-19 pandemic, Racine did not conduct qPCR testing. Stephan R. Kurdas, Lab Services Coordinator, Lab Services Coordinator, personal communication, 10 May 2021.

79 U.S. Environmental Protection Agency, *BEACON 2.0 - Beach Attributes report*, downloaded 26 May 2020 from https://watersgeo.epa.gov/beacon2/reports.html.

80 Specifically, beach latitude and longitude were calculated as the average of start and end latitudes, and the average of start and end longitudes. Beach attribute data source: U.S. Environmental Protection Agency, *BEACON 2.0 - Beach Attributes report*, downloaded 11 May 2020 from https://watersgeo.epa.gov/beacon2/reports.html.

81 National Water Quality Monitoring Council, *Water Quality Portal*, site data downloaded on 5 May 2021 from https://www.waterqualitydata.us/portal/.