

## Environmental • Health Monitoring

### • The Environment & Our Health

The food we eat, the air we breathe, the products we use, and the environments in which we live, work, learn and play affect our health and quality of life. The Health Department monitors and identifies health inequities and works to prevent illness or disease that may be caused by environmental threats, both naturally occurring and human-made. We do this by applying science and regulation to reduce or eliminate harmful environmental exposures—and by alerting and educating Vermonters about the connections between health and the environment.

### • Cyanobacteria Monitoring

Warmer water temperatures provide more favorable conditions for cyanobacteria. Cyanobacteria blooms are now a frequent occurrence in Lake Champlain and other Vermont waters. Under certain conditions, some types of these cyanobacteria can release toxins into the water. A network of trained volunteers identifies and reports their observations of blooms from sites around Lake Champlain and several inland lakes.

### • Lake Champlain Drinking Water Testing

Lake Champlain is the drinking water source for 22 public water systems in Vermont, serving more than 150,000 people. It is possible for toxins produced by cyanobacteria to still be present in drinking water after it has been treated. Although EPA does not require testing for cyanotoxins, the Health Department Laboratory has conducted this testing since 2015. All results through 2017 have been below the health advisory level of concern.

### Cyanobacteria Routine Monitoring Sites

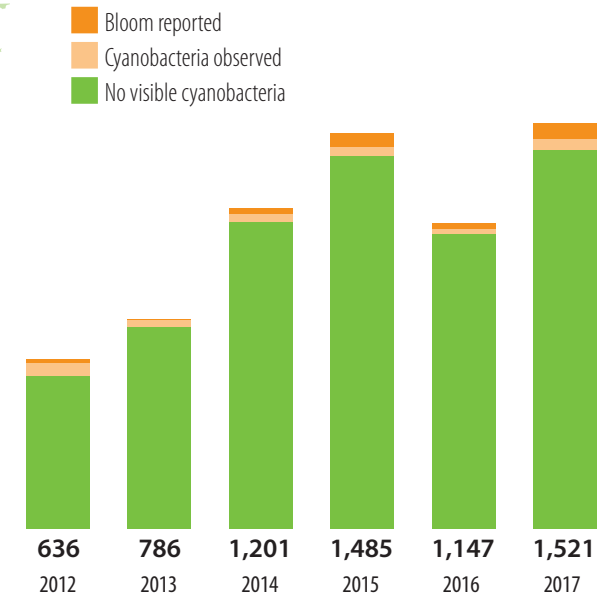
Lake Champlain Committee, Vermont Department of Health, Department of Environmental Conservation Data • 2017



### Cyanobacteria Blooms Reported

Lake Champlain Committee, Vermont Department of Health, Department of Environmental Conservation Data • 2012–2017

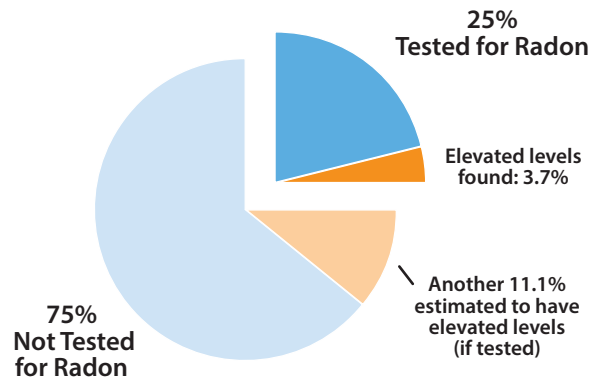
# routine observations and status



## School Radon Testing

Vermont Dept. of Health/Radon School Testing Data • 2006–2017

% of public schools tested for radon



## Vermont Yankee Radiation Surveillance

Vermont Dept. of Health/Radiological Health Program • 2015

Sample Type	# Tests
Direct Gamma Radiation	288
Air: Particulates, Gases and Vapors	400
Water	1126
Milk	36
Sediments	36
Fish	8
<b>Total Tests Performed:</b>	<b>1894</b>

### • Drinking Water Tests for Child Cares

Since 2015, the Health Department has supplied free drinking water test kits to both home-based and center-based child care providers that have a private well or spring. Water quality testing is required by the Department for Children and Families to prevent exposure to lead and other contaminants.

### • Radon Testing in Schools

Radon is a naturally occurring radioactive gas that can cause lung cancer. For most school children and staff, their second largest exposure to radon is likely to occur at school. Schools should test for radon every five years, and after upgrades to heating and ventilation systems.

### • Vermont Yankee Radiation Surveillance

The Health Department continues to monitor the Vermont Yankee Nuclear Power Station in Vernon for radiological and non-radiological impacts on the environment and public health. In 2015, nearly 1,900 samples and measurements taken at and around Vermont Yankee were analyzed; all of the results were in compliance with Vermont’s Radiological Health Rule. Similar tests in 2010 detected tritium contamination, a result of leaking components and systems at the facility. Future testing can help identify contamination that could result during the decommissioning process.

### • Technical Assistance and Hazard Response

The Health Department consults with Vermonters about everyday concerns such as water quality, radon, mold, asbestos, lead and food safety. We also work with our partner agencies to respond to environmental health risks.

## Reponse to Environmental Health Risks

Vermont Dept. of Health • 2010–2017

- 2010 - 2012** Tritium contamination at Vermont Yankee Nuclear Power Station  
Mold, drinking water, food safety, chemical contamination concerns after Irene flooding  
Mercury spills
- 2013 - 2015** Chlorpyrifos contamination of homes in the Rutland area  
Mercury spills
- 2016 - 2017** PFOA contamination of drinking water in the Bennington & Pownal area  
Drinking water testing for lead in schools  
Indoor air testing for child cares near dry cleaners  
Ricin threat at retirement facility in Shelburne

## Environmental • Consumer Health

### • Food & Lodging

The Health Department works to protect the health of Vermonters by promoting sanitation and ensuring food safety. More than 6,000 sites where food is prepared, served, processed or stored are licensed and regularly inspected. Inspectors respond to all complaints received from the public, investigate foodborne disease outbreaks, and trace back recalled products. We also regulate lodging facilities, including hotels, bed and breakfasts, and children’s camps.

### • Chemicals in Children’s Products

Children’s bodies are uniquely susceptible to chemical exposures. In 2014, Act 188 created the Chemical Disclosure Program at the Health Department to collect information from the manufacturers on the presence of chemicals in children’s products. As of 2017, 66 were designated as “chemicals of high concern to children”. Nearly 700 disclosure reports of children’s products containing these chemicals have been submitted. We encourage consumers to learn more about these chemicals.

### • X-Ray Safety Inspections

More than 500 facilities that use x-rays are registered and inspected by the Health Department. At inspection, we provide guidance to improve health and safety compliance. Most compliance issues relate to patient shielding, quality of film storage and use, and radiation monitoring of workers. In 2016, 95% of facilities were in compliance after inspection.

### Food & Lodging Inspections

Vermont Dept. of Health/Food & Lodging Program • 2017

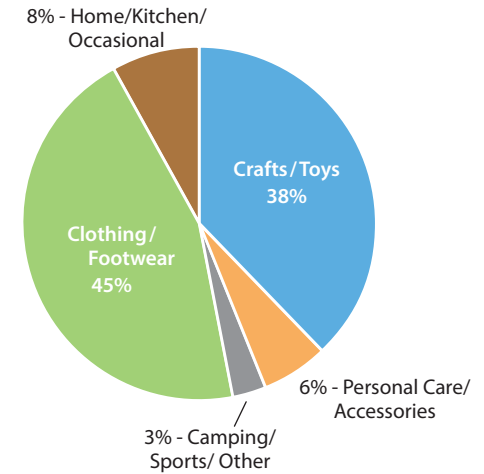
Types of food and lodging establishments inspected:

- Restaurants, Commercial Caterers
- Mobile Food Units, Push Carts
- Manufactured Foods
- Temporary Food Stands (Fairs, Farmer’s Markets)
- Home Bakers, Home Caterers
- School Lunch Programs
- Seafood Vending
- Shellfish Sanitation
- Children’s Camps
- Lodging Sanitation

### Chemicals in Children’s Products Reports

Vermont Dept. of Health/Chemical Disclosure Program • 2016–2017

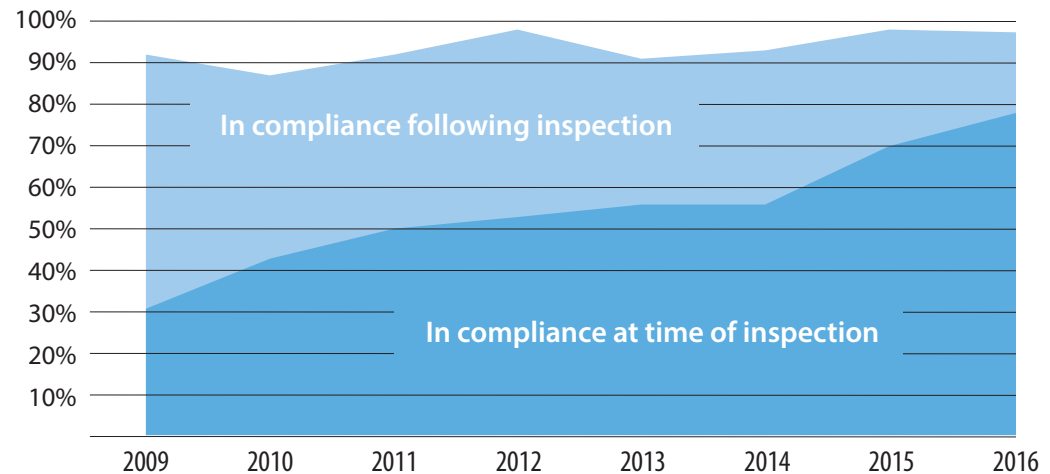
Product categories for 681 reports submitted since 2016 –



### Safety Inspections of X-Ray Facilities

Vermont Dept. of Health/Radiological Health Program • 2009–2016

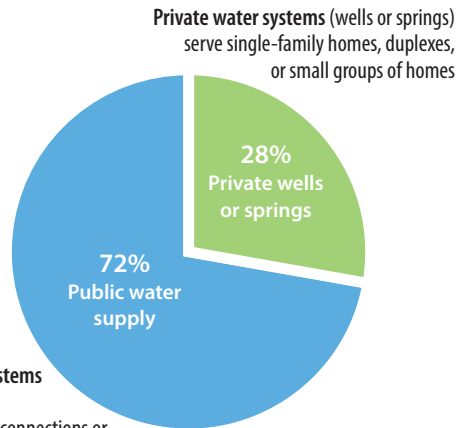
% of inspected facilities in compliance with health and safety standards



## Public & Private Drinking Water Sources

Vermont Dept. of Environmental Conservation • 2016

% of population served by drinking water source

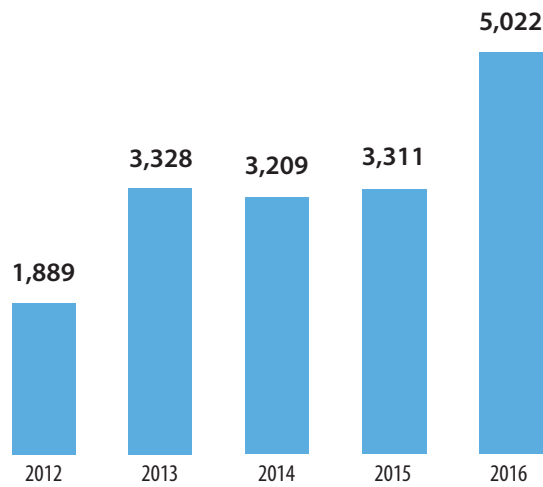


**Public water systems (town water)**  
serve at least 15 connections or  
25 year-round residents

## Home Drinking Water Testing

Vermont Dept. of Health Laboratory Data • 2012–2016

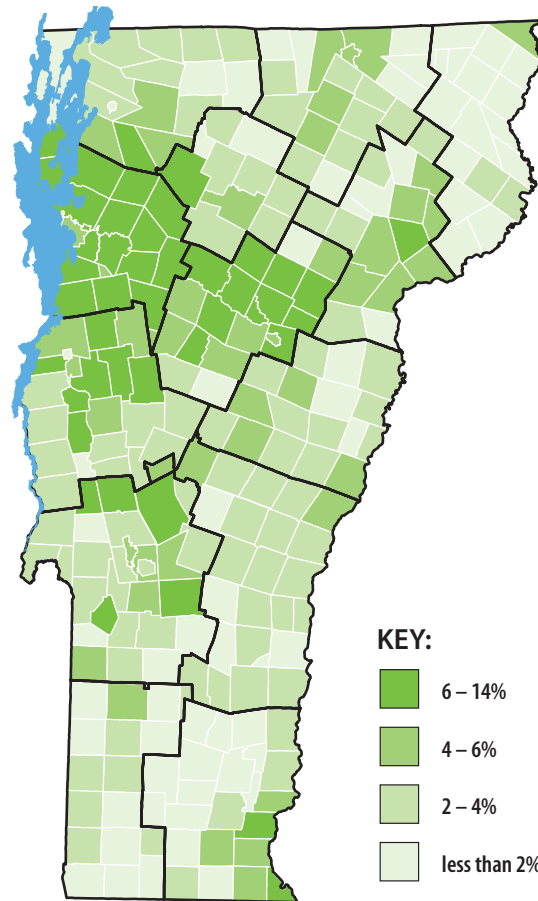
# water quality test kits analyzed from private wells and springs



## Home Radon Testing

Vermont Dept. of Health/Radon Program • 1988–2017

% of residential buildings tested by town



### • Healthy Homes: Safe Drinking Water

More than one-quarter of Vermonters get their drinking water from a private spring or well. Unlike public systems, private water sources are not required to be tested, yet many naturally occurring and human-made contaminants can be present. You often cannot see, smell or taste these contaminants, and they can affect your health.

Since 2013, information about private well testing has been provided to home owners when a new well is drilled, and when a home with an existing well is purchased. Only 5% of Vermonters with private drinking water sources have had their water tested. Private wells should be tested regularly.

### • Healthy Homes: Radon Testing

Radon is a naturally occurring radioactive gas that is estimated to kill 50 Vermonters a year due to lung cancer. Radon can only be detected by testing for it, and homes with elevated radon levels are found throughout the state. The average level of radon in homes is 2.3 picocuries per liter, compared to 1.3 in the U.S. All homes should be tested.

### • Asbestos & Lead Regulation

The Asbestos & Lead Regulatory Program works to protect Vermonters from exposure to asbestos and lead when maintaining, renovating or demolishing buildings, and when cleaning up after a fire, flood or storm damage. In performing maintenance, repairs, renovation or demolition on a building, there are specific state regulations to follow for safely working with asbestos or lead-based paint.

## Environmental • Climate & Health

### • Climate Change Affects Our Health

Climate change in Vermont is resulting in hotter summers, shorter winters, and more frequent storms. Extensive flooding from Tropical Storm Irene, increasing occurrence of Lyme disease, and more frequent cyanobacteria (blue-green algae) blooms are examples of how climate change can affect our health.

While all Vermonters are affected, some people and places may be more challenged by these changes than others.

### • 87° F is Hot for Vermont

Vermonters are at greater risk for serious heat-related illnesses, and even death, when the state-wide average temperature reaches 87°F or hotter.

Although 87°F may not seem very hot, Vermonters may be especially at risk for heat illness because we don't experience hot weather very often. Many homes do not have air conditioning, and we have a large population of older adults who tend to be at higher risk for heat illnesses.

### • Hot Weather in Our Future

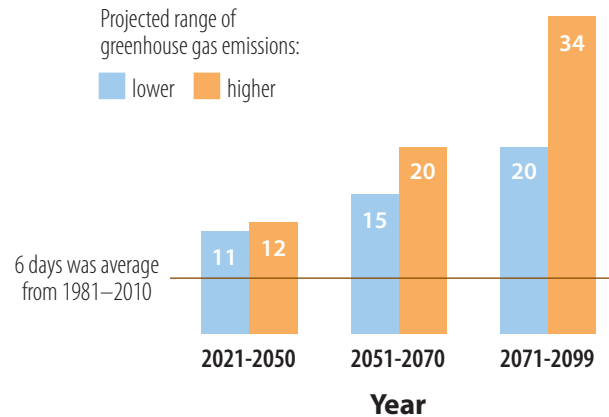
Between 1981 and 2010, Vermont experienced an average of six days each year when the temperature reached or exceeded 87°F.

Projections by climate scientists show that we can expect 15 to 20 days per year reaching 87°F or hotter by mid-century, and 20 to 34 days per year by the end of the century.

### Current & Projected Extreme Heat Waves

PRISM Climate Group, Oregon State • 1981–2010  
Vermont State Climate Office • projections 2021–2099

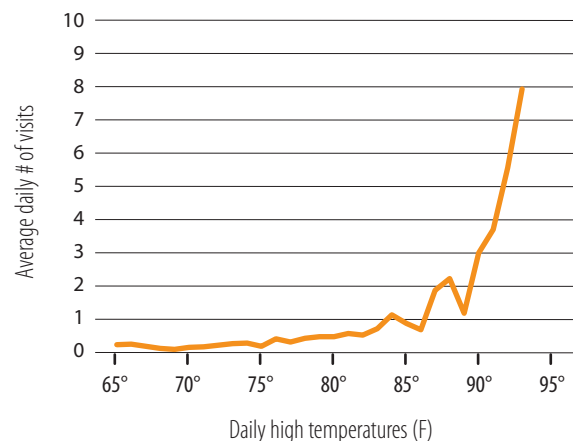
Estimated # days per year reaching at least 87° F



### Emergency Dept. Visits for Heat Complaints

Vermont Early Aberration Reporting System • 2004–2013  
PRISM Climate Group, Oregon State • 1981–2010

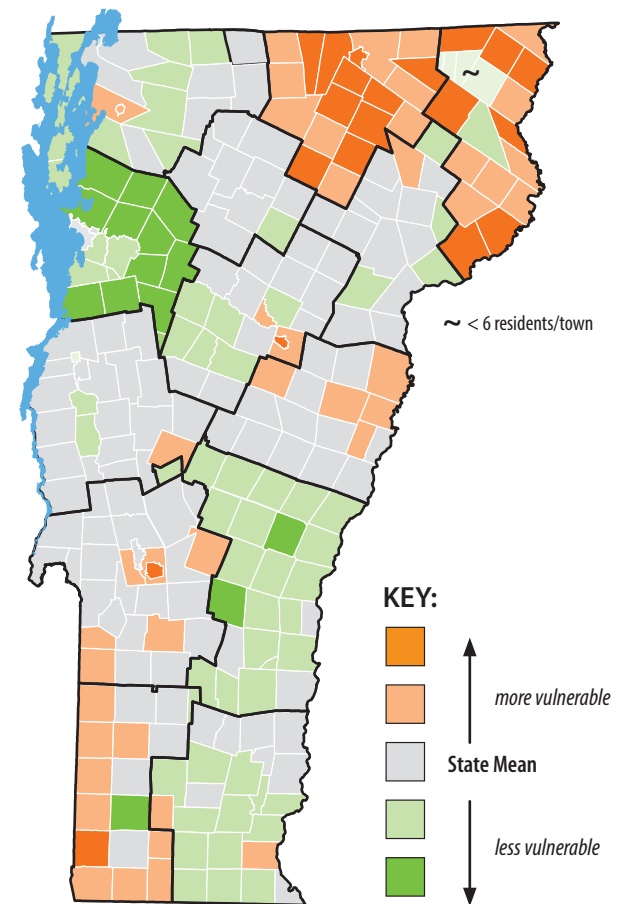
Average daily # of visits for heat complaints, by daily high temperature



### Heat Illness Vulnerability Index

Vermont Heat Vulnerability Assessment Report • 2016

Towns with populations that are more/less at risk from heat



## Climate Change in Vermont

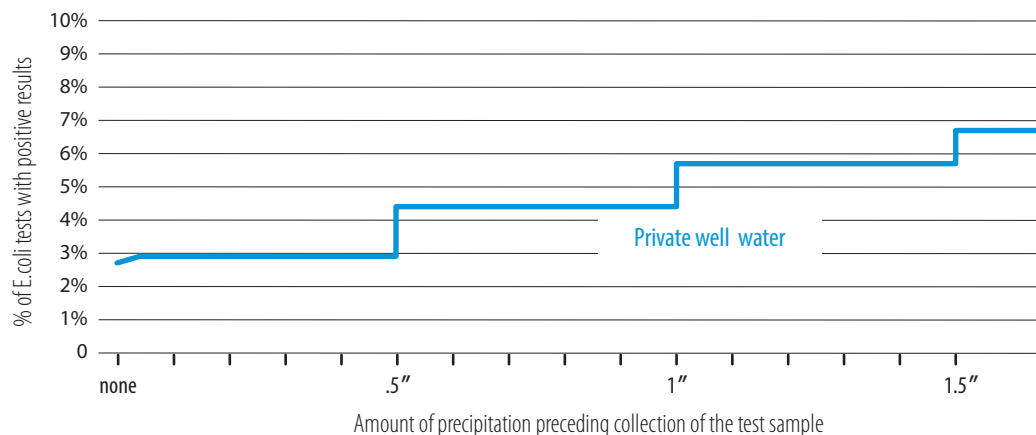
National Oceanic & Atmospheric Administration (NOAA)/Climate at a Glance • 1965–2017  
 Vermont Climate Change Indicators/Weather, Climate & Society • 2011  
 U.S. Historical Climatology Network • 1965–2014



## Heavy Precipitation Events & E.coli Detection

Vermont Dept. of Health Laboratory • 2005–2014

% of positive E. coli tests increases as amount of recent precipitation increases



## • Vermont's Heat Vulnerability Index

The heat vulnerability index draws together 17 measures in six different themes to quantify the risk for heat-related illness at the town/city level. The index takes into account measures related to population, socioeconomics, health, environment, climate and heat illness. The index maps the overall vulnerability of Vermont towns to heat-related events—a first step in identifying populations that may be most affected by hot weather.

## • Climate Change & Precipitation

Compared to average weather conditions from 1981 to 2010, by the end of the century the Vermont State Climate Office projects that the total annual precipitation will increase by three to 10 inches, and the frequency of the heaviest precipitation events (about three inches of rain) will increase from a once every seven years occurrence to once every two to three years.

## • E.coli as a Measure of Water Quality

A common way to detect bacterial contamination in water is to monitor for Escherichia coli (E. coli) bacteria. The presence of E.coli in water can indicate recent fecal contamination.

Historical analyses of state meteorological and water quality data from 2005 to 2014 indicate that the risk of bacterial contamination of drinking water increases following heavier precipitation events. Drinking water quality was negatively affected following precipitation of 0.5 inches or more. Although detection of E. coli in public drinking water rarely occurred, detection rates in private well water doubled following days with at least 0.5 inches of precipitation.