

OCTOBER 2023

PRWC NEWSLETTER

PRWC | Protecting Water Resources for Generations

EPA – Weather and Climate Report

ENVIRONMENTAL PROTECTION AGENCY
UPDATED ON JULY 26, 2023

Rising global average temperature is associated with widespread changes in weather patterns. Scientific studies indicate that extreme weather events such as heat waves and large storms are likely to become **more frequent or more intense** with human-induced climate change. This report focuses on observed changes in temperature, precipitation, storms, floods, and droughts. (See page 2)

Long-term changes in climate can directly or indirectly affect many aspects of society in potentially disruptive ways. For example, warmer average temperatures could increase air conditioning costs and affect the spread of diseases like Lyme disease, but could also improve conditions for growing some crops. More extreme variations in weather are also a threat to society. More frequent and intense extreme heat events can increase illnesses and deaths, especially among vulnerable populations, and damage some crops. While increased precipitation can replenish water supplies and support agriculture, intense storms can damage property, cause loss of life and population displacement, and temporarily disrupt essential services such as transportation, telecommunications, energy, and water supplies.

This Issue:

EPA Report
PAGE 1

EPA Key Points
PAGE 2

PRWC
Water Monitoring &
Assessments
PAGE 3-7

Upcoming Events
PAGE 8

3 Ways to Use
Leaves in the Garden
PAGE 9

Trivia Q & A
PAGE 10-11

EPA WEATHER & CLIMATE REPORT

SUMMARY OF KEY POINTS

U.S. and Global Temperature

Average temperatures have risen across the contiguous 48 states since 1901, with an increased rate of warming over the past 30 years. Nine of the top 10 warmest years on record have occurred since 1998. Average global temperatures show a similar trend, and all of the top 10 warmest years on record worldwide have occurred since 2005. Within the United States, temperatures in parts of the North, West & Alaska have increased the most.



Heat Waves

Heat waves are occurring more than they used to in major cities across the United States. They are occurring three times more often than they did in the 1960s—about six per year compared with two per year. The average heat wave season is 49 days longer, and individual heat waves are lasting longer and becoming more intense (hotter).

Heavy Precipitation

In recent years, a higher percentage of precipitation in the United States has come in the form of intense single-day events. The prevalence of extreme single-day precipitation events remained fairly steady between 1910 and the 1980s but has risen substantially since then. Nationwide, nine of the top 10 years for extreme one-day precipitation events have occurred since 1996.

River Flooding

Increases and decreases in the frequency and magnitude of river flood events vary by region. Floods have generally become larger across parts of the Northeast and Midwest and smaller in the West, southern Appalachia, and northern Michigan. Large floods have become more frequent across the Northeast, Pacific Northwest, and parts of the northern Great Plains, and less frequent in the Southwest and the Rockies.

Learn More @ www.epa.gov/climate-indicators/weather-climate

Water Monitoring – In Your Watershed

Stream assessments within the Pomperaug Watershed support comprehensive evaluation of the physical, chemical and biological characteristics of the watershed in relation to human health, ecological conditions, and designated water uses. Documenting such characteristics helps establish cause-and-effect relationships, evaluate the effectiveness of current and future remediation and restoration activities, provides input for management tools such as models, and support scientifically-based decisions for preserving and improving the quality of our local water resources.



How does PRWC help to monitor and protect your area as weather patterns & water quality change around the world?

1. Bacteria and Nitrate Monitoring
2. Stream Temperature Monitoring
3. Road-Stream Crossing Assessments
4. Annual Macroinvertebrate Survey

Bacteria and Nitrate Monitoring

PRWC launched a bacteria and nitrate monitoring program in 2019. Nitrogen is an indicator of fertilizer runoff, septic failure, and animal waste. Nitrogen is also a contaminant of major concern for Long Island Sound (fed by all the rivers and streams throughout Connecticut) where it is a driver of harmful algae blooms and low oxygen conditions. Sampling for nitrate provides a screening level indicator for total nitrogen. Bacteria are an indicator of general water quality degradation from septic effluent and agricultural runoff, which are the principle sources of contamination in the Pomperaug River. High bacteria levels inhibit swimming and other recreational activities.

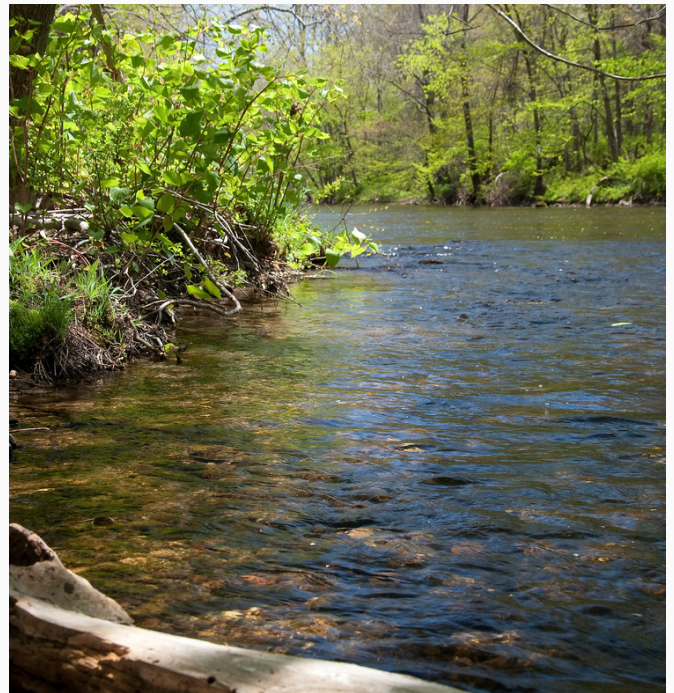
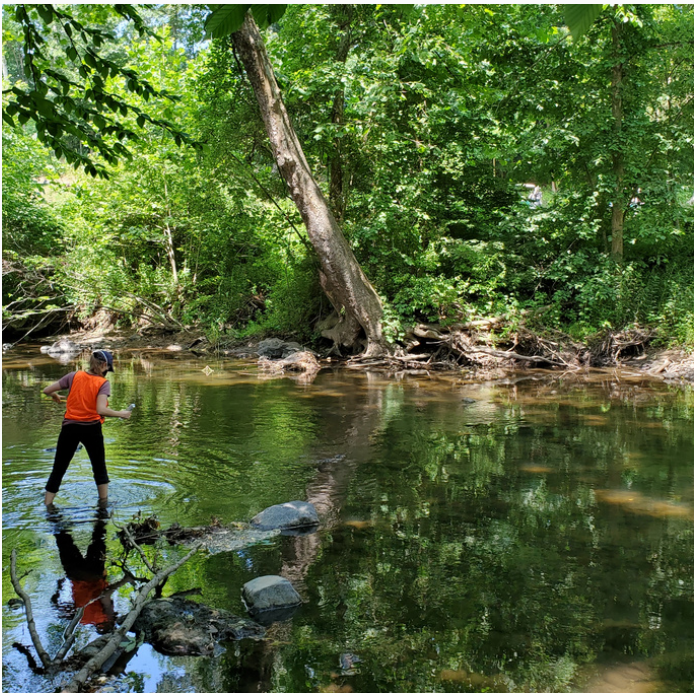


The goal of PRWC’s bacteria and nitrate monitoring is to establish an improved baseline of water quality conditions near sites targeted for the future implementation of best management practices (BMP) identified in the Watershed Based Plan. The Plan addresses stream impairments identified in CT DEEP’s Biannual Water Quality Report to Congress through the implementation of BMPs designed to reduce non-point source pollutant loading to the Pomperaug River and its tributaries.

By sampling for E. coli bacteria and nitrate, PRWC has been able to further characterize pollutant sources and problem areas, and further bracket priority areas for non-point source pollution and stormwater runoff reduction projects. Findings from PRWC’s monitoring are detailed in an Addendum to the Watershed Based Plan and is available on the organization’s website.

Stream Temperature Monitoring

The Volunteer Stream Temperature Monitoring (VSTeM) Network is Connecticut DEEP's newest volunteer monitoring program. Established in 2008 with support from the US EPA Volunteer Monitoring Equipment Loan program, the VSTeM Network includes a growing number of volunteer monitoring organizations across the state. Participants in the program are trained by CT DEEP staff to install a stream temperature data logger (programmed to record hourly stream temperature) at local stream sites of interest each spring, in order to capture data during the critical summer flow period (June-August). Loggers are retrieved by volunteers in the fall (September-October) and returned to CT DEEP for download and data analysis and data quality control assurances. The data generated by the VSTeM Network volunteers are instrumental to DEEP's water quality standard development, fish habitat assessment, and potential stream habitat restoration efforts, and identifying cold water habitat essential to the longevity of species like wild brook trout.



Water temperature can be inherently variable as it is influenced by factors including air temperature, riparian characteristics, and groundwater input. Water temperature itself is an important variable in determining the biology of a particular stream segment. This data can be used to complement ongoing watershed efforts to protect/restore aquatic habitat by both understanding water temperature variability and to be able to characterize the type of water temperature habitat (cold, cool, or warm water) of the stream segment.

Road-Stream Crossing Assessments

During the 2020 field season, PRWC began surveying road-stream crossings in the Pomperaug Watershed following protocol from the [North Atlantic Aquatic Connectivity Collaborative \(NAACC\)](#). PRWC participates in the assessment of road crossings for non-tidal streams and river, using NAACC's data collection forms and training materials.



Aquatic life passage is difficult and sometimes impossible when streams and rivers are fragmented by inadequate stream crossings (examples: too small, water moving too quickly, physical blockages, elevated above stream-grade). Through these assessments, data collected by field technicians are submitted to NAACC and listed in their database according to how severe of a barrier exists. The severity rating is calculated based on the metrics recorded in the field. These assessments generate a map-based inventory on culverts, bridges, or crossings which can be used to prioritize crossings that may need repair or replacement to improve the aquatic life connectivity of the stream or river as well as the ability of the culverts and bridges to convey more intense one-day storm event that are occurring more frequently.

Annual Macroinvertebrate Survey

Since 2006, PRWC has conducted annual Macroinvertebrate Surveys following a protocol established by Connecticut Department of Energy and Environmental Protection (DEEP) for Stream Riffle Bioassessment by Volunteers (RBV). RBV is a 'treasure hunt' during the fall (September through November) for Connecticut's healthiest streams! RBV volunteers monitor streams specifically for pollution sensitive macroinvertebrates – small organisms that spend a large part of their life cycle clinging to the undersides of rocks in river riffles. If volunteers are able to find four or more of these 'Most Wanted' macroinvertebrate types at a survey location, it provides DEEP with evidence to document the stream as having excellent water quality – making it one of Connecticut's healthiest streams!



The RBV program provides volunteers with a standardized methodology for using aquatic macroinvertebrates to assess the relative water quality of wadeable streams (those that you can walk across). Aquatic macroinvertebrates are excellent indicators of stream quality not only because they are relatively easy to collect and identify, but because certain species are very sensitive to changes in water quality. The most sensitive species can tolerate only very small amounts pollution and will therefore only be present in Connecticut's healthiest streams.

FALL | OCT - NOV

UPCOMING EVENTS

Volunteer, Learn, Meet Your Community



Dr. Marc J. Taylor Memorial Walk

SAT, OCT 14 | 9:00AM

PLATT FARM PRESERVE, SOUTHURY, CT

PRWC is co-hosting a guided walk in memory of one of PRWC's founders, Dr. Marc Taylor. Approximately 2 miles, mostly flat, along the river. Meet at the kiosk across from parking in the field on Flood Bridge Road. All welcome. \$FREE



O&G Geology Tour

SAT, NOV 4 | O&G'S SOUTHURY TRAP ROCK QUARRY

SESSION 1 | 10:00AM - 12:00PM * SESSION 2 | 1:30PM - 3:30PM

Co-Hosted By: Flanders Nature Center and Land Trust & PRWC. Have you wondered about Connecticut's mysterious volcanic past? Join us on a tour of O&G's Southbury trap rock quarry for a field trip highlighting some fascinating geological facts and views of ancient volcanic rocks and minerals. **Rain or Shine, Storm would cancel.*

Registration coming soon to @ [Flandersnaturecenter.org/program-events/](https://www.flandersnaturecenter.org/program-events/)

3 WAYS TO USE FALL LEAVES IN THE GARDEN



1 Create a Compost Pile

Make compost for a valuable soil amendment. If you are not already composting, now is a good time to start. Pile autumn leaves in the corner of your yard. Ideally, keep leaves from blowing away with chicken wire. To speed up decomposition, shred those leaves with a mulching lawnmower. Layer these carbon-rich “brown” leaves with high-nitrogen “green” material such as grass clippings, dead plant matter, and kitchen scraps. The “green” feeds the bacteria that will be doing all the work of breaking down the leaves. Layer three or four inches of old leaves with an inch of fresh grass clippings or other green, leafy yard waste.

2 Mow Into Lawn

Researchers at Michigan State University have shown that lawns actually benefit from a thin layer of leaves. Leaf litter improves the soil, lessening the need for fertilizer in the spring. They recommend a mulching lawnmower with a blade 3 inches high and mowing once a week while the leaves are falling.

3 Make Leaf Mold

Much beloved by English gardeners. Simply rake the leaves into a big pile. If you shred them, they will decompose faster, but you can still make leaf mold without shredding. Keep the leaves moist and let the fungi take over! After one to three years, the leaves will have disintegrated into a dark, sweet-smelling, soil conditioner that is high in calcium and magnesium and retains water. It's exceptional as an amendment for veggie and flower gardens and a great addition for potting soils. Learn more @ www.almanac.com

TRIVIA QUESTIONS

ANSWERS ON NEXT PAGE

- 1 What is the weight of water in one cubic foot?**
10.2 lbs, 42.6 lbs, 62.4 lbs, 71.8 lbs
- 2 68.7% of the world's freshwater is found in....**
Clouds, Rivers, Glaciers, Sea Ice
- 3 What is the driest place on Earth?**
Gobi Desert, Namib Desert, Atacama Desert, Death Valley
- 4 What gas is added to carbonated water to make it fizzy?**
Carbon Dioxide, Hydrogen, Nitrogen, Oxygen
- 5 Which river runs through the Grand Canyon?**
The Nile, Mississippi River, Yangtze River, Colorado River
- 6 The Mariana Trench is the deepest point in which ocean?**
The Indian Ocean, Atlantic Ocean, Pacific, Antarctic Ocean
- 7 What type of fish is a Sockeye?**
Bluegill, Carp, Salmon, Pike
- 8 How are earthquakes measured?**
Volcanic Explosivity Index (VEI), Richter Scale Enhanced, Fujita Scale
- 9 What is the largest living structure that is visible from space?**
The Great Barrier Reef, Great wall of China, Berlin Wall, Mt. St. Helen
- 10 Which is the most common gas in the atmosphere?**
Nitrogen, Hydrogen, Sulfur, Oxygen



TRIVIA ANSWER KEY



- 1** 62.4 pounds
- 2** Glaciers
- 3** The Atacama Desert
- 4** Carbon dioxide
- 5** The Colorado River
- 6** Pacific Ocean
- 7** Salmon
- 8** The Richter Scale
- 9** The Great Barrier Reef
- 10** Nitrogen

