Connecticut preps for weather extremes, flooding highlighted in climate report

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New London police Officer Deana Nott walks back to dry land after talking to motorists stranded in their cars due to flooding on Bank Street in New London during torrential rains Sept. 12, 2018. Climate experts say flooding will become more common as conditions in the northeast become warmer and more volatile. (Sean D. Elliot/The Day)

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Dr. Juliana Barrett, an ecologist focused on the state's coastal habitats, hopes students in her **University of Connecticut Climate Corps (https://climate.uconn.edu/climate-corps/)** class learn at least two basic lessons: Before buying a property, find out if it's in a **flood zone (https://msc.fema.gov/portal/home)**; and don't get Lyme disease.

"If they go away from the course and remember those, I've done my job," said Barrett, an associate extension educator with **Connecticut Sea Grant (https://seagrant.uconn.edu/)** at UConn's Avery Point campus in Groton.

Barrett's lessons are fitting for the Northeast region, which faces seasonal shifts, extreme weather, sea level rise, erosion, increased flooding and higher risks of diseases — including West Nile virus and Lyme disease — carried by fleas, ticks and mosquitoes, according to a stark U.S. climate report released on Nov. 23.

"All the predictions are essentially worse," Barrett said. She noted an increase in unusual weather events, such as an October nor'easter that caused coastal flooding, and a rise in what she called "sunny day flooding," which occurred during the most recent full moon, inundating roadways and the entrance to Bluff Point State Park in Groton. "Flooding and coastal erosion are moving up to the forefront," she said. "People are seeing that flooding doesn't have to come from a major storm. And people are starting to say, 'What are we going to do about this?' Nobody's ready to retreat, so we have to really think about what we're doing."

Issued by 13 federal agencies, the **climate assessment (https://nca2018.globalchange.gov/chapter/18/)** projected that by 2035, the Northeast — encompassing New England and New York, Pennsylvania, New Jersey, Maryland, Delaware and West Virginia — would become more than 3.6 degrees warmer on average than during the preindustrial era. The increase would be the biggest temperature rise in the contiguous U.S. "and would occur as much as two decades before global temperatures reach a similar milestone," the report said.

"The changing climate of the Northeast threatens the health and well-being of residents through environmental changes that lead to health-related impacts and costs, including additional deaths, emergency room visits and hospitalizations, higher risk of infectious diseases, lower quality of life," the report said.

The agencies said climate change already has intensified weather events and thrown the Northeast's traditional seasons for a loop.

"Less distinct seasons with milder winter and earlier spring conditions are already altering ecosystems and environments" in the region, the report said. The agencies warned that without greater efforts to mitigate climate change, the region's shifting seasons threatened "the very character of the rural northeast" and eventually could stifle natural resource-based industries including agriculture, fishing, forestry and outdoor recreation, which combine for almost a quarter of a trillion dollars in annual economic activity and more than 1.5 million jobs.

The maple syrup industry — while brimming with production records the last few years — has seen seasonal shifts that scientists say could change the nature of the business. Climate change "is making sugar maple tapping more challenging by increasing variability within and between seasons," the report noted.

Mark Harran, president of the Maple Syrup Producers Association of Connecticut, said he didn't think climate change would impact the industry in the state within the next decade.

"New technology allows us to get more bang for the buck," he said, noting syrup makers sometimes use vacuums to extract sap out of trees, and reverse osmosis units to remove water from the sap and cut down on boiling time required to make syrup.

But Harran acknowledged that Connecticut tapping seasons have "started earlier and earlier," with sap ready to flow when winter days are warm and nights are below freezing.

"The old adage was to tap on Lincoln's birthday," he said. "But now people are tapping in mid- to late-January. We get cold nights and warm days earlier."

The biggest threat to the maple industry, Harran said, is a mix of blight and insects "partially due to global warming and global trade." For example, he said the Asian longhorn beetle — which feeds on hardwood trees, especially sugar maples — comes over on wooden pallets from China and has caused outbreaks in Canada and the U.S., including as close as Worcester, Mass.

State Department of Energy and Environmental Protection Commissioner Rob Klee noted climate change also "brings more southern bugs farther north, and without cold winters, you lose that kill off," threatening state forests.

"Climate change exacerbates pest infestation," Klee said, citing up to 20 percent standing deadwood in the state's eastern forests after years of drought and the spread of the gypsy moth. "When the birds and bugs aren't aligned, bad things happen."

Gary Lessor, a meteorologist at Western Connecticut State University, said the report highlights impacts of climate change "we are already seeing."

"We used to have spring. We used to have fall," Lessor said. "Now it just seems as though you go from winter to early summer. We certainly seem to go from summer straight into extreme coolness."

Not every winter will be warmer, Lessor noted, but on average winters will continue to be warmer as they have for the last 20 years. The state could more often see food crop loss due to early bud break, like the loss of the peach crop in 2016, he said. Ski areas may have to rely on more artificial snow, an expense that could translate into higher ticket prices, he added.

'Hope for the future'

Barrett and Klee said state agencies, researchers, educators, students and municipalities already are working on ways to mitigate and adapt in the wake of climate change.

Earlier this year the Connecticut Institute for Resilience and Climate Adaptation, or CIRCA, recommended the state plan for up to 20 inches of **sea level rise (https://circa.uconn.edu/2018/03/27/sea-level-rise-projections-for-the-state-of-connecticut-webinar-recording-available/)** in Long Island Sound by 2050. CIRCA noted "sea level rise is a well-established impact of a warming planet due to expanding warming oceans and melting ice currently trapped on land."

The national climate report said that with New England's industrial development along rivers, canals and coasts, "these areas often have a higher density of contaminated sites, waste management facilities and petroleum storage facilities that are potentially vulnerable to flooding," opening the door to more contaminants in soils and waterways and health risks to ecosystems, animals and people.

Protecting critical infrastructure such as wastewater treatment plants, fire and police stations and power plants like Millstone Power Station are all part of hazard mitigation plans established throughout the region, Barrett noted. Her students have worked with emergency management directors in Stonington, East Lyme, Old Lyme and Madison to create **coastal storm preparedness (https://uconnclear.maps.arcgis.com/apps/MapSeries/index.html?appid=1a891bfc67d8455eb3178245ef271e70)** maps with evacuation routes, emergency alerts and town-specific resources.

The Climate Corps course, which debuted in the 2017-18 academic year, educates students on the local impacts of climate change in the fall semester, followed by a spring semester independent study letting students assist communities adapting to climate change. This spring, students worked with Old Lyme officials on a vulnerability assessment that examined sea level rise and precipitation.

"They come in full of ideas ... and they're willing to put all these solutions out there. It gives me hope for the future," Barrett said.

Students and municipalities continue to study the economic, environmental and legal implications of elevating roads due to sea level rise, she said.

Whether **CIRCA (https://circa.uconn.edu/)**, the **Nature Conservancy (https://www.nature.org/en-us/about-us/where-we-work/united-states/connecticut/)**, the **Southeastern Connecticut Council of Governments (http://seccog.org/resil-haz)**, Connecticut Sea Grant or **Sustainable CT (http://sustainablect.org)**, Klee said there's "a whole network focused" on conducting research and providing resources and grants to grapple with "climate change we're already experiencing."

"The time has passed to start any debate on focusing on mitigation or adaptation," Klee said. "You need to do both, and way faster."

In 2017 the Nature Conservancy, SCCOG and the Southeastern Connecticut Enterprise Region worked with Groton, New London, Norwich, East Lyme, Groton, Ledyard, Montville, Salem, Stonington and Waterford to create a **regional resilience guidebook (http://seccog.org/wp-content/uploads/2018/05/Final-Southeastern-Connecticut-Regional-Resilience-Guidebook-March-2017.pdf)** examining six areas: water, food, economy, ecosystems, energy and transportation.

Deanna Rhodes, Norwich's director of planning and neighborhood services, noted her city is part of the **Community Emergency Response Team (http://www.norwichct.org/747/Community-Emergency-Response-Team-CERT)**, a volunteer program developed by the Federal Emergency Management Agency and the U.S. Department of Homeland Security to help communities plan, train and respond to emergencies.

The state, Klee said, has worked to reduce greenhouse gas emissions through incentives such as electric vehicle rebates, legislation calling for heavy emissions cuts and increased renewable energy procurements, and the **Regional Greenhouse Gas Initiative (https://www.rggi.org/)**, a cooperative effort among nine northeastern states to cap carbon dioxide emissions in the power sector.

Klee said residents looking to take action on climate change can recycle, perform a home energy audit and keep an open mind on green options during "transition times when you're looking to buy a new car or replace a furnace."

He added that efficiency programs through the **Connecticut Green Bank (https://www.ctgreenbank.com/about-us-2017/)** — incentivizing home energy audits and improving the power grid — should serve as models for other states until "the federal government comes back from the wilderness they're wandering in."

"This is not a partisan issue in Connecticut," he said. "Folks are energized from the whole spectrum, including leading businesses who have sustainability goals, universities trying to go zero carbon ... and state and regional folks you need working in the same direction."

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