



FOLLOW THE SCIENCE

MEMBER UPDATE
CENTRAL & WESTERN
NEW YORK CHAPTER
FALL/WINTER 2017

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Follow the Science



Here in Central and Western New York we are lucky to have many prominent universities and research institutions doing groundbreaking work to understand the natural world and our relationship to it. Academic researchers frequently approach our chapter, wanting to connect with our local work to protect lands and waters. Their motivation for doing so is almost always the same: **The Nature Conservancy turns science into action.** This is the reason many of you, our supporters, invest in our work as well.

The threats people and nature face today are immense and expanding. The impacts of dangerous weather events like Hurricanes Harvey, Irma and Maria raise critical questions about how to make our communities more resilient. Locally, weather extremes challenge our farmers and those living in floodplains and coastal zones. Luckily, The Nature Conservancy is in the business of solving problems—and science and action are both essential parts of the equation.

In the following pages, you'll read about how science guides everything we do—from identifying new lands to protect, to using a new strategy to fight the invasive hemlock woolly adelgid, to developing solutions to help communities address flooding, and so much more.

But even the best science cannot move conservation forward without funding, public support and enabling governments. The Conservancy cannot stagnate and cannot slow down. Quite the opposite: we must pick up speed, get creative and connect with new partners. We must be simultaneously daring and deliberate.

As we approach the end of 2017, we hope you will consider the role science plays in ensuring that nature can continue to meet our needs, and the role you can play sustaining nature. With your gift, we promise that we will follow the science—here at home and around the world.

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Healthy Habitats, Healthy World

Trustee Laurie Dann commits to conservation right here, right now.



Trustee Laurie Dann's passion for conservation was formed on the shores of Lake Erie: "I grew up on the beach and in the woods with the birds and all the critters. I'll never forget my grandmother's excitement when a scarlet tanager landed in her yard, or when I saw my first evening grosbeak. I was lucky to have many people in my life who respected nature."

Dann grew up with an awareness of The Nature Conservancy, too, but learned about the organization's local work just a few years ago when her friend Pamela Righter invited her to join a bus tour of Montezuma Wildlife Refuge in Seneca Falls, N.Y.

"We were riding through the refuge on a bus. It was raining and the windows were foggy but Chapter Director Jim Howe kept everyone engaged with a lively discussion of local projects. When we got off the bus we saw a trumpeter swan in the misty wetland—that was really special."

That trip inspired her to learn more about the Conservancy's local work. Everywhere the organization works, Dann says, success comes down to healthy habitats. And birds can tell us a lot about the quality of habitats if we listen.

"On a trip to Panama I visited an area the Conservancy helped protect and saw my first harpy eagle," says Dann. "Harpy eagles are almost completely gone in Central America due to the destruction of their habitat. Healthy habitats benefit all life. But the exact opposite is also true. Miners used to take canaries to the mines to alert them if the air was bad. Today, if the habitat is gone or degraded, if the fish aren't there, if the soil is polluted and the air isn't clean, the birds won't return. When the birds are gone, other animals—including people—will follow."

Thankfully, we have not yet reached that point with the lake Dann calls home. This, she says, represents an important challenge: "In the four generations my family has summered on Lake Erie, very little has changed. But changes are coming quickly. It's up to us to safeguard the Great Lakes. That's a tall order. Fortunately, The Nature Conservancy has the science and know-how to get the job done."

"With their contribution to the Our World campaign, Laurie and husband Tom Hunt not only committed to the future of nature, but to the state of nature right now," says Chapter Director Jim Howe. "We are grateful for their generous leadership gift and the confidence they've placed in our chapter's ability to deliver conservation results."

"Tom and I were inspired to give to the Our World campaign because our world needs advocates now—right now, right here," says Dann. "By acting locally, we can protect a resource that's important for the entire world."



NATURE DEPENDS ON YOU
Nature needs all of us, and we need nature. To learn how you can support The Nature Conservancy's Our World Campaign, contact Jan Miller at jan_miller@nature.org or **(585) 546-8030 x7928**.

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SCIENCE GUIDES US

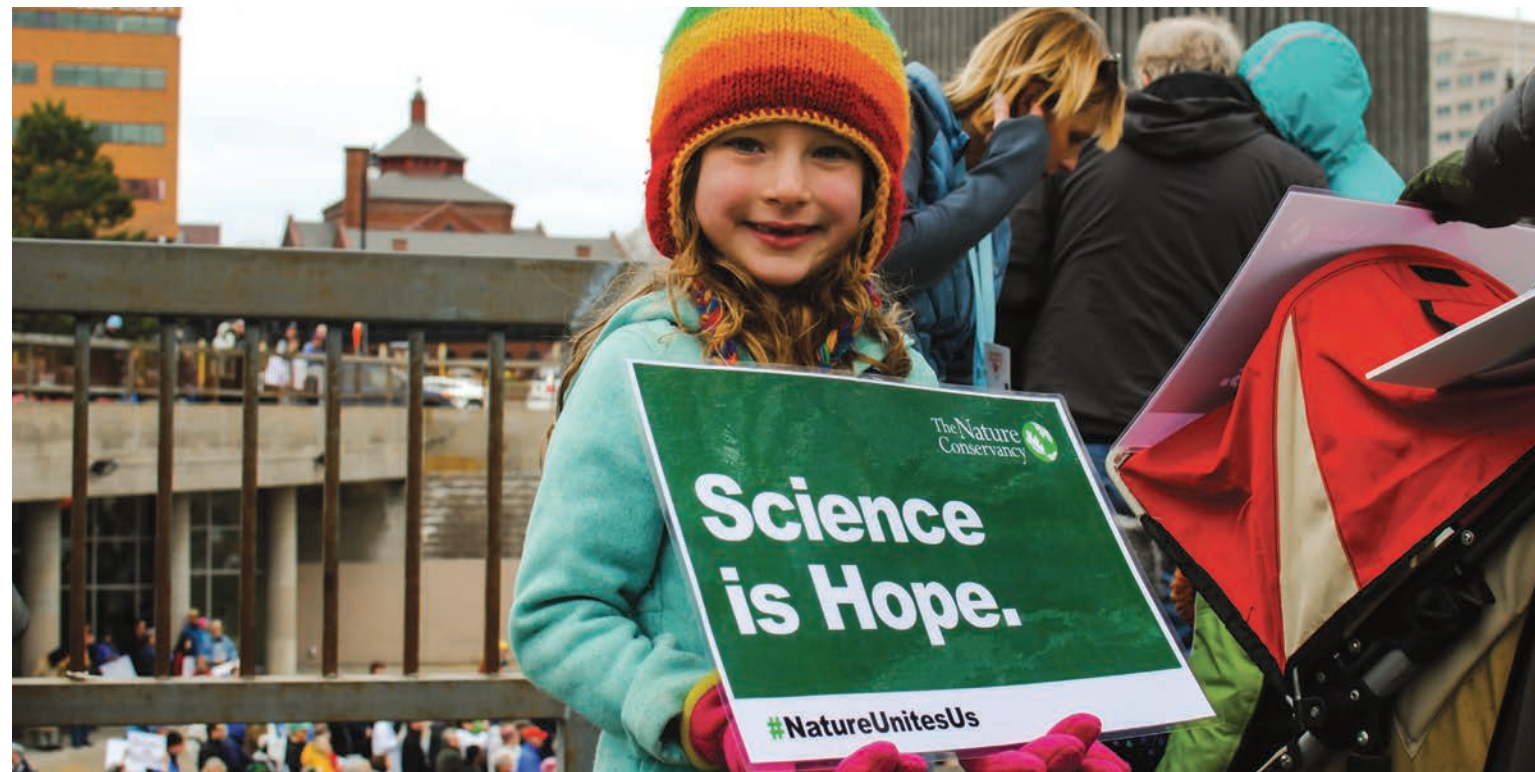
We can create a world in which people and nature thrive—as long as we follow the science.

Can we truly advance human development and protect nature at the same time? As the world's population grows to 9 billion, this is a key question—one that most certainly impacts The Nature Conservancy's work in Central and Western New York.

Because science is at the root of everything we do, we analyzed whether the outcome of our vision—creating a world in which people and nature thrive—is truly achievable. The answer? Yes. But only if we as a society can change the trajectory of our relationship with nature. Science-based methods need to guide those changes. Here's a look at some of the ways science is guiding conservation in your own backyard.

Science Guides Land Protection.

Our land protection staff use mapping and science-based tools like GIS and the Natural Resource Navigator to identify places to protect, analyze pros and cons, and look at their resilience in the face of climate change. This summer, science guided our work to protect a 40-acre parcel just south of Honeoye Lake that adjoins the state's Honeoye Inlet Wildlife Management Area. Science also led us to apply for a grant to improve water quality in Owasco Lake, which has some of the worst algal blooms in the Finger Lakes. Once funded, the project will use a new GIS mapping tool to make decisions about where to protect land for the greatest impact.



Know of a special place in need of protection? Contact Andy Wheatcraft, Critical Lands Coordinator, at awheatcraft@tnc.org or (585) 546-8030 x7933.

Science Guides Stewardship.

Encroaching invasive species often stand to impede the success of conservation projects. Science told us that our Sodus Bay wetland restoration project—a partnership with Save Our Sodus and NYS DEC would be at risk if we did not also tackle a water chestnut infestation in the area. This summer, a crew of staff, volunteers and interns removed 1,900 pounds of invasive water chestnut from the south end of Sodus Bay. Without these actions, water chestnut could have invaded the soon-to-be constructed channels and potholes.



Get involved in our battle against invasives at sleloinvasives.org.

Science Guides Restoration.

Our restoration projects are helping to make Central and Western New York's waters more drinkable, swimmable and fishable; our communities safer from flooding; and our forests stronger in the face of climate change. The latest science and technology also helps us measure our progress. This fall, we deployed drone technology at Honeoye Lake to get a picture of how the newly engineered stream and tree plantings are influencing the flow of sediment and nutrients. We'll also use the drone on Tug Hill to capture information about forest health and connectivity ahead of our climate resilience project there.



Explore these projects and more at nature.org/newyork.

Science Guides Policy.

With science as our guide, The Nature Conservancy promotes key policy actions to drive positive change across our region and throughout New York State. 2017 has proven to be a banner year



for environmental policy in New York, with Governor Cuomo and the New York State Legislature making a historic commitment to rebuild our drinking water and wastewater infrastructure. This year's State Budget includes \$2.5 billion for water projects in every corner of our state.



Use your voice for policy actions that support conservation at nature.org/newyork.

Science Guides Our Future.

This July, a hard-working crew of three LEAF interns and their mentor worked alongside our staff on a variety of science-based projects. They assisted Seneca Park Zoo with a biodiversity research project called *One Cubic Foot* designed to document all wildlife that passes through a one cubic foot cube over a 24-hour period. They also conducted a survey for hemlock woolly adelgid, documenting a heavy infestation along the shoreline of Hemlock Lake that may inform future work with Cornell University (see p. 6, "Hope for Hemlocks"). More than 30 percent of LEAF students go on to pursue environmental careers.



Learn more at nature.org/leaf.



DIVE INTO OUR SCIENCE

We've updated our conservation approach and methodology to meet the challenges of our time. We invite you to explore the new edition of Conservation by Design at nature.org/science.



HOPE FOR HEMLOCKS

THE Nature Conservancy deploys new technique against tree-killing pest

Two years ago, The Nature Conservancy and Tanglewood Nature Center staff made a frightening discovery: a dense infestation of hemlock woolly adelgid on our Frenchman's Bluff Preserve in Elmira.

The hemlock woolly adelgid (HWA) is an invasive pest that's killing New York's hemlocks at an alarming rate.

It can take as little as four years to kill a healthy tree, and HWA spreads quickly.

But The Nature Conservancy acted quickly, too, reaching out to Cornell University for help implementing a long-term, natural solution to combat the pest.

This spring, the NYS Hemlock Initiative at Cornell University and The Nature Conservancy made the first operational wild release of silver flies (Diptera: Chamaemyiidae), one of HWA's most important natural predators, at Frenchman's Bluff—a move that may be a game changer across the state and the East Coast.

Over the past century, HWA has spread from the Appalachians all the way to Maine, and mild winters are hastening the invasion. In

New York State, we've seen the infestation quickly spread from downstate and the Catskills up towards the Finger Lakes and further west. If not controlled, the infestation could spread to the critical protected forests of the Adirondacks and Tug Hill. Efforts to control the infestation in the South are failing, and the stands of greyed out, dead hemlock trees serve as a warning.

But there's hope. "New York is on the cusp of some great discoveries in the field of biocontrols that use natural predators to combat HWA," says Mat Levine, a Conservation Land Manager at The Nature Conservancy who connected with Cornell Forest Entomologist Mark Whitmore to release silver flies at Frenchman's Bluff.

They released 240 adult silver flies into mesh bags installed on low lying branches of hemlocks infested with HWA. The mesh bags were left in place for 10 days to ensure the silver flies mated and laid eggs, ensuring a new population of HWA predators. Analysis of samples collected from those releases has demonstrated that they have become established and successfully reproduced.

OKTOBERFOREST

Brewers and The Nature Conservancy collaborate for healthy forests and beer's main ingredient—water!

The Nature Conservancy and dozens of breweries across the nation worked together this fall to make beer fans aware of the critical link between the health of America's forests and beer's main ingredient—*water*.

Partner breweries from coast to coast—including several in Central New York—participated.

Healthy forests are vital to successful breweries: **more than 90 percent of beer is water, and more than 50 percent of America's water comes from our forests.**

America's forests help improve water supplies in a number of

ways. Forests shade streams, lakes and snow from evaporation; the forest floor helps filter sediment; and tree roots help hold soil together so it can store water like a sponge.

Recently forests have become threatened by more severe fires, drought and increased pest damage. The U.S. Forest Service estimates that about half of our national forests are in need of restoration in order to maintain natural benefits for people, water and wildlife.

"As a longtime homebrewer myself, I am thrilled The Nature Conservancy is partnering with breweries on the OktoberForest

campaign," says The Nature Conservancy's Chris Topik, Director of Restoring America's Forests. "The Nature Conservancy has been working to conserve and restore America's forests for more than 60 years—we are drinking in the opportunity to help conserve beer's main ingredient." Learn more about the OktoberForest awareness campaign, and read profiles of local breweries that participated at OktoberForest.org.



More than 90 percent of beer is water, and more than 50 percent of America's water comes from our forests.



TIP A TREE

It's not too late to show your thanks to forests for keeping our waters clean. Learn more at OktoberForest.org.

GET FLOOD SMART

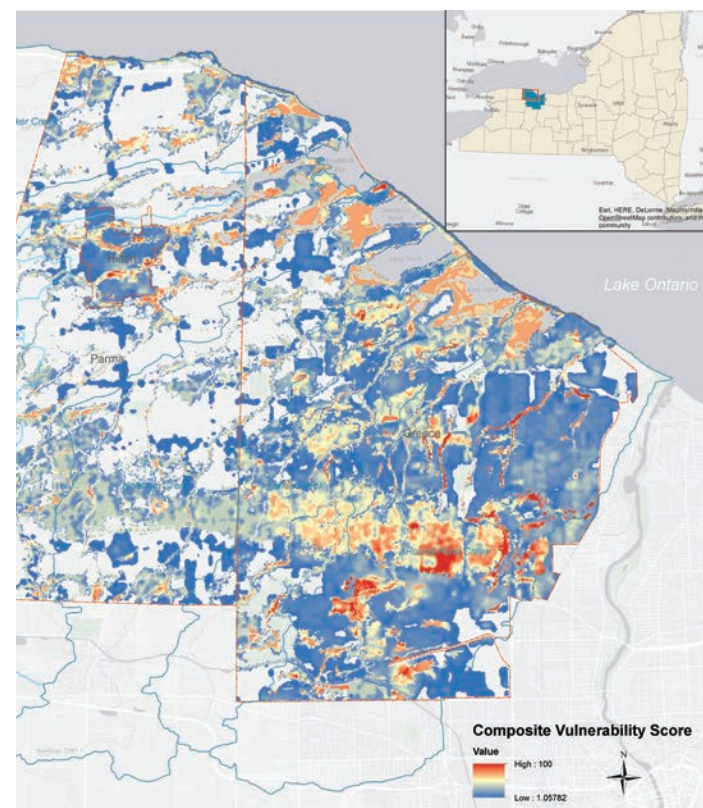
Local communities use science to reduce their vulnerability.

We're helping communities in New York develop real, actionable solutions to protect people from flooding.

Flowing water does not recognize political boundaries—so municipalities should work across borders to develop solutions to flooding. That's one of the key ideas behind our Flood Smart Communities program, a collaborative effort to develop real, actionable solutions for people in New York to address flooding. To pilot the concept, our staff worked with representatives from the towns of Hilton, Greece and Parma—which share Lake Ontario tributaries and regularly experience flooding.

A key challenge is that one third of flooded properties nationwide lie outside of the Federal Emergency Management Agency's official mapped floodplains.

In some parts of the country this number is as high as 70-90 percent. In order to help those at risk, we need to understand where and why floods most often occur and come up with solutions that are tailor-made for the people they are serving.



A vulnerability assessment that uses social, economic, structural and physical indicators of susceptibility to flooding for the towns of Greece, Hilton and Parma. © TNC.

In Hilton, Greece and Parma, The Nature Conservancy spent nearly three years mapping floodplains, assessing where communities are vulnerable to flooding, and evaluating where nature is helping out. With that information in hand, our Flood Smart team has helped demonstrate the urgency of flooding to elected officials and presented a list of priority action steps.

As a result of this work, our partners, the Genesee/Finger Lakes Regional Planning Council and the University of Buffalo, are looking to help communities across the state establish floodplain protection overlay districts—a land-use planning tool that will help limit development in areas prone to flooding and protect wetlands that help absorb water during storms.

A Better Map

Now that our Flood Smart Communities program is up and running, The Nature Conservancy is ready to start the process in an area that experiences even more severe flooding. Working with the Southern Tier Central Regional Planning & Development Board, Steuben County and the University of Buffalo, our scientists will help representatives from towns along the Cohocton River identify the best ways to prevent flooding in their communities.

In order to understand who is most at risk, we've collaborated with the University of Buffalo Regional Institute to create a comprehensive map of flooding in the area. "Vulnerability assessments typically include demographic data from the census," says Stevie Adams, a Nature Conservancy freshwater specialist and head of the Flood Smart program, "but that only gives you part of the picture. This is exciting because the outputs go beyond what these kinds of maps typically do." By layering additional data—for example, structural information about when properties were built and locations of economic engines—powerful visuals will provide a clearer picture to help local governments better plan how they distribute resources and address the problem of flooding.

Tailor-Made Solutions

Every community is different. That's why the Flood Smart Communities strategy lets the needs and priorities of the people at risk dictate the solutions it creates. In Monroe County, for example, the towns involved in the initial pilot have decided to focus on protecting natural infrastructure

—like wetlands and floodplains—and strengthening inter-municipal communication and collaboration to address their flood risks. They've also determined their work going forward will be more effective with the county's storm water coalition involved.

In future projects, other towns may decide to employ engineered solutions like rain gardens or bio-swales. "The solutions are meant to be tailored to the geography we're looking at," says Adams.

Nature Unites Us

The Flood Smart Communities project fosters partnerships across municipal boundaries to strengthen flood management efforts. Collaboration can take a variety of forms, ranging from informal arrangements like sharing information and bartering equipment, to

more formalized cooperation through mechanisms like shared services agreements.

In the end, the goal for every town and municipality that participates is the same: Safer communities. Flood Smart Communities is a program that proves nature unites us.

Did You Know?



40% of small businesses that close when damaged by flooding never reopen.

Solutions for the Lake Ontario Shore

The Nature Conservancy was a leading proponent of the new water-level regulation plan—Plan 2014—for Lake Ontario and the St. Lawrence River that the U.S. and Canada adopted last year. A healthy Great Lake is the cornerstone of our economy, and the new plan balances all of society's needs: shoreline protection for Lake Ontario and Montreal, hydropower, commercial shipping, outdoor recreation like boating and fishing, and the need for a healthy lake and river.

This spring and summer saw unprecedented precipitation in the Lake Ontario watershed, leading to record high water levels on the lake and extensive flooding and erosion along the shoreline of the lake and river.



It's unfortunate that these high-water levels coincided with the introduction of Plan 2014. Experts on all sides of the issue agree, however, that this year's record precipitation would have caused millions of dollars of damage no matter what lake-level management plan was in effect. We empathize with our many friends and colleagues who suffered damage to their properties, and are relieved that no lives were lost.

The Nature Conservancy is a strong supporter of providing assistance to communities on the lake and river. In June, Governor Cuomo and the state legislature agreed to provide \$45 million for shoreline municipalities, homeowners and small businesses.

It's vital, however, that we not just seek to get through the current crisis, but also begin to plan for the long term. The Lake Ontario shoreline flooded in 1952, 1973, 1993 and now in 2017. These natural 20- to 25-year cycles of high water will occur again.

The Nature Conservancy is leading efforts at the local, state and federal levels to help communities reduce risks by identifying critical infrastructure that must be strengthened, retrofitted or relocated; and developing lasting solutions for sustainable development on the shoreline.

Let's help our communities rebound from this year's floods—and let's also make smart decisions regarding what happens in our vulnerable coastal zones.



NEED FLOODING ASSISTANCE?

State funding is available for those impacted by Lake Ontario and St. Lawrence River flooding. Call the Lake Ontario Flood Assistance Hotline at 1-866-244-3839 or visit www.ny.gov.

A Sweet Spot for Farmers

Q&A with NatureNet Fellow Shannan Sweet

Our world faces unprecedented challenges with climate change—challenges that NatureNet Science Fellows are helping to solve by pushing conservation science into entirely new areas. The NatureNet Science Fellows program is a partnership between The Nature Conservancy and premier universities that's designed to amplify the Conservancy's work by investing in the research of early-career scientists. Each year, fellows hosted by Cornell's Atkinson Center for a Sustainable Future provide our chapter with a unique opportunity to connect their expertise with our local projects.

Shannan Sweet, a 2017 NatureNet Science Fellow, is working to help farmers adapt to climate change right here in New York. To understand the impacts of the 2016 record-breaking drought on farmers and their ability to cope with drought risk, Sweet, along with NatureNet mentor and Cornell University professor David Wolfe, surveyed over 200 farmers. Results show that over half the farmers in southern and western New York lost greater than 30 percent of their rain-fed crops, with some reporting over 90 percent crop failure. 39 percent of farmers surveyed have subsequently found alternate water sources or purchased irrigation equipment.

Q. Last year, it was too little rain. This year, it seems that there is too much rain. What does the extreme weather mean for farmers?

One benefit of this year's heavy rain is the replenishment of the wells, ponds and streams that farmers rely on for irrigation and farm-related water uses. This does not spare them from the risk of a short-term, late summer drought. On the flipside, many farmers cannot get out and plant seeds at this crucial time because they are unable to maneuver equipment through



sopping wet fields. Variability in precipitation will likely increase, which means flooding and drought will continue to challenge New York farmers.

Q. You have said that it is a tricky time to be a farmer in New York, but also an exciting time. How so?

Climate change could bring opportunities to grow longer season crops and different varieties of perennial fruit crops like apples and grapes. But frost damage due to increased late winter thaws and early spring freezes is also a possibility.

Q. Having grown up in a family of farmers suggests that your work matters to you on a personal level. Tell me more.

I grew up in the Finger Lakes and my family still runs a greenhouse near Seneca Lake. My mother was one of the founders of the Seneca Lake Pure Waters Association in the 1980s. I've been interested in protecting the waters here from a very young age.

Being a part of these local communities for most of my life, I am also interested in helping farmers. Essentially, I want to help protect both agricultural and water resources in New York State. And the two are not, and cannot be, mutually exclusive. Both are important economically, culturally and environmentally. My goal is to help New York farmers adapt to and lessen the impacts of climate change in a way that also serves to protect water quantity and quality across the state.

Q. What excites you about your work?

The fact that we are helping farmers to think more deeply about climate change and its impacts excites me. It's rewarding to see them proactively think about what they can do to deal with its effects and even mitigate them. Most farmers are recognizing that they can no longer rely on historical weather patterns for their region to tell them when to plant, what to plant, and how to grow it.

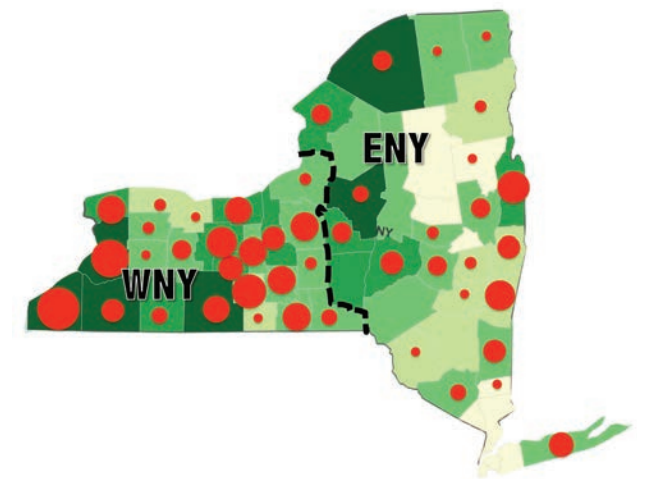
Q. When you started your fellowship, you were talking mainly to farmers, but you are now speaking to elected officials. Has that surprised you?

I never pictured myself talking to senators and congressional leaders about farmers' perceptions, but it is heartening to know that these conversations have the potential to bring resources that might help farmers deal with future climate-related issues.

The Conservancy's NatureNet Science Fellows Program is made possible by the leadership and generosity of visionary donors, including Roy Vagelos and Steve Denning, who believe that conservation needs to base its work not just in ecology and biology, but in an interdisciplinary approach to science and evidence.

Drought Survey Key Findings:

- **The record-breaking 2016 drought affected farmers across New York State** with more severe effects in Western and Central NY than Eastern NY.
- Crop loss estimates from a late summer survey of over 200 farmers suggest that **more than 70 percent of rainfed field crop and pasture acreage had losses greater than 30 percent, with some reporting over 90% crop failure.**
- **Most fruit and vegetable growers who irrigate** lacked the irrigation capacity and water supplies to keep up with the drought, and **estimated crop losses of up to 35 percent** were reported.
- Common suggestions from farmers on help they could use in dealing with future drought included better long-range weather forecasts, financial assistance to expand irrigation capacity, and more information on drought resistant crops.



Drought survey responses by county. Darker green colors indicate a greater number of farms. Red dots designate counties that responded; larger dots indicate a greater number of respondents.

Weather extremes are one of the most challenging climate change impacts for farmers. Sweet is now conducting a survey to see how farmers coped with excessive rain this year and will be analyzing those results through early spring 2018. Her findings will help The Nature Conservancy assess how best to collaborate with farmers in the region.

The Nature Conservancy

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The Nature Conservancy's Great Western Checkerboard Project in Montana. © Steven Gnam

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FALL/WINTER 2017



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FOLLOW THE SCIENCE



Paddleboarding on Hemlock Lake © TNC, Mat Levine