

2015 Highlights of Extension

COLLEGE OF AGRICULTURE, HEALTH AND NATURAL RESOURCES



TYING RESEARCH TO REAL LIFE

Providing for a global sustainable future through scientific discovery, innovation, and community engagement.

UConn | COLLEGE OF AGRICULTURE,
HEALTH AND NATURAL RESOURCES

EXTENSION



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*Gregory Weidemann
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Message from the Dean & Director

UConn Cooperative Extension is an important component of the College of Agriculture, Health and Natural Resources and is a critical part of our land grant mission. Extension reaches every community in Connecticut in some way. In fact, UConn Extension provides eleven or more programs in every Connecticut community and in many cases much more.

This year, we are highlighting several new program areas. Inside, you will see how we are using innovative software—the Story Map—to demonstrate land use change in Connecticut. We share updates on our

programs that relate to healthy living, nutrition, food safety, and local foods. You can learn about our volunteers and the youth we serve through our 4-H programs. You also can learn about how we are addressing our changing environment—managing the effects of wind on forests and water conservation in agriculture. These highlights—and all of our Extension programs—demonstrate how UConn Extension is “tying research to real life” for citizens, communities, and businesses across Connecticut.

Strategic Values

Mission

Ensuring a sustainable global future through research, teaching and public engagement utilizing agricultural, health, and environmental sciences.

Vision

The College of Agriculture, Health and Natural Resources will provide for a global sustainable future through scientific discovery, innovation, and community engagement. Our accomplishments will result in safe, sustainable, and secure plant

and animal production systems, healthier individuals and communities, greater protection and conservation of our environment and natural resources, balanced growth of the economy, and resilient local and global communities.

2015 by the Numbers

UConn Extension Ties Research to Real Life

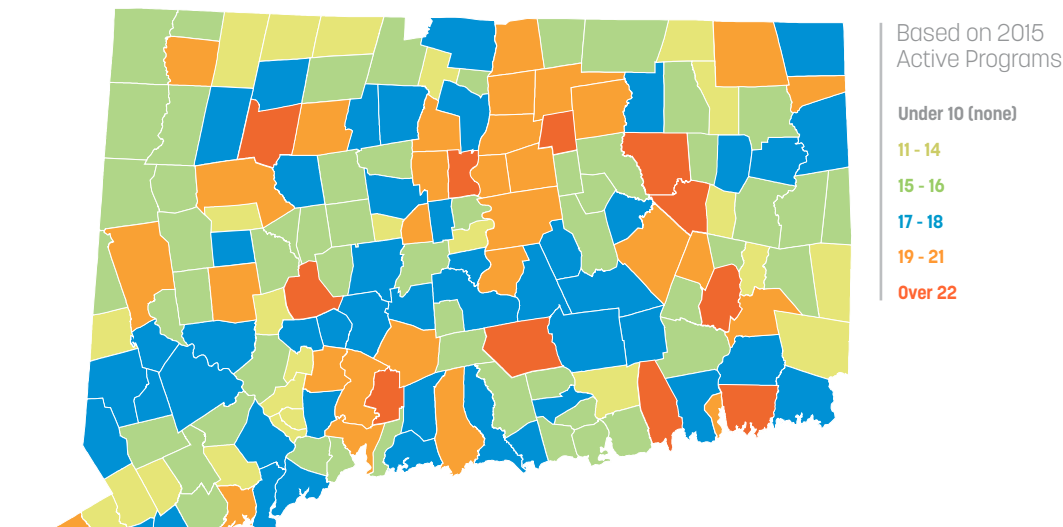
The College of Agriculture, Health and Natural Resources (CAHNR) is committed to its status as a land grant institution, serving Connecticut and the global economy through research, education, and public engagement. Extension fulfills the land grant university's third mission of outreach and public engagement.

Over 100 UConn Extension specialists work in the 169 local communities across Connecticut as educators, problem solvers, catalysts, collaborators and stewards. To many Connecticut residents these specialists are the face of UConn (see large map). Our eight regional Extension Centers, the Sea Grant program at Avery Point, the 4-H Education Center at Auerfarm, the Home and Garden Education Center and

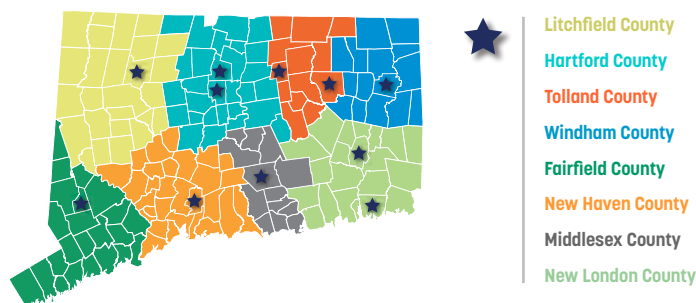
the UConn Extension office in Storrs are strategically located throughout the state (see small map) to meet local needs.

UConn Extension's off campus classrooms include: high-tech greenhouses and computer labs, coastal estuaries, elementary school gardens, community centers for high risk teens and municipal town halls. We use an interdisciplinary approach and take knowledge directly to the public. UConn Extension enhances small businesses, the economic and physical well-being of families and offers opportunities to improve the decision-making capacity of community leaders. To accomplish this, Extension focuses on CAHNR's four core values: learning, discovery, engagement, and global citizenship.

Number of Active UConn Extension Programs in Towns



UConn Extension Locations



\$11.8 million

in active grants

690

clinical, extension or other expert services provided

34,555

hours of community service donated by our 1,587 Master Gardener volunteers valued at \$797,183 to the communities served

350

people trained in smartphone GPS mapping

14,670

youth learned about nutritious eating through FoodCorps

3,780

hours spent by urban agriculture students in classroom instruction

3,722

people in 18 states have accessed the Aquaculture Mapping Atlas

70,000

hours of community service donated by 1,423 4-H volunteers and 711 4-H youth members valued at \$1.61 million to the communities served

1.3 million

gallons of stormwater are treated each year by rain gardens installed using the UConn Extension app

\$189,000

invested by 21 agencies to offer the People Empowering People (PEP) program in their communities



Michael P. O'Neill
Associate Dean & Associate Director
UConn Extension
College of Agriculture, Health
and Natural Resources

Message from the Associate Dean

As we reflect on the success of UConn Extension across the state, I also want to recognize the growth of our internship program.

Two years ago, we began partnering with the Center for Career Development to offer summer internships to UConn students. From one intern in the Storrs office at the beginning, the program has grown to 13 interns our second year, and we anticipate 20 interns this summer. Included in this number are the 4-H Fair summer interns, all of whom are now UConn students. Over 50 students applied for the 2016 internships, and we expect the program to continue growing.

Kerrin Kinnear is a senior majoring in environmental studies, and interned with Dave Dickson during the summer of 2015 at the Center for Land Use Education

to get a sense of the drivers behind regulations, factors affecting LID implementation, and the impact of regulations.

“Interning at CLEAR has shown me how sustainability concepts I learn about in the classroom come to life in real world applications,” Kerrin says. “Through speaking with community planners across the state, I have gained insight into the real motives behind current environmental initiatives, as well as the obstacles towns face in implementing low impact development in the field.”

Each of these paid internships introduces UConn students to Extension, as they tie research to real life across the state. We leverage our program effectiveness, giving Extension programs an extra pair of hands, and the students gain experience.

“The internship program was a win-win for the Urban and Community Studies intern I worked with and for the communities involved in a project along the Naugatuck River involving the economic impact of trails,” Extension Educator Laura Brown says. “My intern helped pull together a literature review that created a foundation for the impact study, and gained connections in his field.”

Your support of our UConn Extension Centennial Fund will allow us to increase the number of internships offered in 2017; an investment in the future of our programs. We are embarking on a journey where our role in providing science-based solutions to global challenges is needed more than ever before. I hope you will join us on this unprecedented endeavor.

“Each of these paid internships introduces UConn students to Extension, as they tie research to real life across the state.”



Kerrin Kinnear interviewing town staff during her UConn Extension internship.

and Research (CLEAR) in Haddam, Connecticut. As part of her internship, Kerrin worked with town staff on the adoption and implementation of low impact storm regulations. You can read more about the status of low impact development (LID) in Connecticut on page 24. Kerrin interviewed key staff in towns that have begun to adopt LID-friendly storm water regulations

Donate Now



Tracking Land Cover Change in Connecticut

Created by Emily Wilson, Chester Arnold and John Vain
College of Agriculture, Health and Natural Resources, University of Connecticut

How is Connecticut's landscape changing? Where? How fast? Come explore the information and maps that answer those questions.

Connecticut's Changing Landscape is a project at the University of Connecticut Center for Land Use Education and Research that uses remotely sensed imagery to track changes over the 25 year period from 1985-2010.



Telling Stories with Maps

Article by Emily Wilson
& Chet Arnold

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Most people like to look at maps. How many times have you looked at a map just to figure out where you're going, and then become distracted by towns, rivers and mountains off to the side? And in this day and age, maps—including satellite imagery—are all around us, on our phones and in our cars. This past year, Extension faculty at UConn's Center for Land Use Education and Research (CLEAR) have concentrated on using maps in a new way—and done so well that they've won an international award for their efforts.

CLEAR's Extension faculty has long used maps to educate land use decision makers and the public about Connecticut's landscape and natural resources. The foundational research and Extension project of CLEAR is called Connecticut's Changing Landscape (CCL), which uses remotely sensed imagery to measure changes to our landscape over time. Currently, the project covers the 25-year period from 1985 to 2010 (a 2015 update is underway). The landscape is

characterized into land cover classes, which denote what the satellite imagery actually sees on the ground; for instance, development, turf, agricultural field, and forest.

The CCL website created by Extension faculty has graphs and data tables, but most of the website is devoted to maps, making them easily accessible and available for the user in a number of formats, from the static to the highly interactive. Recently, though, new technology has upped the ante on the term "highly interactive." Mapping technology industry leader Esri Corporation has created a web format called "Story Maps." Story Maps allow the developer to combine interactive map windows with explanatory text, photos, videos, and just about any other type of information that can be put on the web. This has proved ideal for many CLEAR projects, especially CCL. The project's complex combinations of land cover categories, time intervals, derivatives and different scales (from statewide to town to watershed to local) can be confusing, and a Story Map format allows the creators to, quite literally, tell the story of in what way, how

TOOLS & TRAINING



“... the Changing Landscape project has become a valuable resource for the planning and natural resource management sectors of Connecticut ...”

much, and where our landscape is changing. For instance, the figure shows a screen capture from the “Turf and Grass” page of the Story Map, showing the map on the left and text and graphics on the right. The map is “live” and interactive and the user can pan, zoom, and click on various features for more information.

Story Maps are a new and constantly evolving format. In 2015, Esri held an international storytelling with maps contest. Emily Wilson, a Geospatial Technology Extension Educator, decided that the CCL Story Map, called **Tracking Land Cover Change in Connecticut**, was worthy of an entry due to its unique analysis and display of complex CCL data. Helping her to plan the story, including the component videos, photos and



A screen capture of one page of the CCL Story Map shows an interactive map of turf/grass areas on the left, with text and graphics on the right.

graphics, was Extension Water Quality Educator Chet Arnold, who also serves as CLEAR’s Director of Outreach.

The result: Connecticut’s Changing Landscape Story Map was named the Best Science/Technology/Education Story Map in the 2015 Esri *Storytelling with Maps* contest—one of only four first place winners from over 400 entries from around the globe. The story map was featured at the Esri User Conference, held each year in San Diego, CA and attracting over 16,000 attendees. Emily presented in two sessions, conducted an on-camera interview and received the award directly from Esri President and Founder Jack Dangermond (photo, page 6).

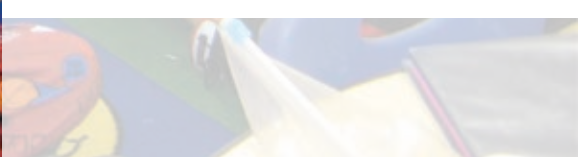
Since its inception in 2004, the Changing Landscape project has become a valuable resource for the planning and natural resource management sectors of Connecticut, used in a wide variety of ways by academia, state and local government, and nonprofit organizations. With the addition of the Story Map, which has had thousands of individual viewers in just the past 8 months since it was posted, Extension hopes to bring the story of Connecticut’s Changing Landscape to an even broader audience.

CLEAR Story Maps

Emily and Chet’s success helped to inspire other Extension faculty at CLEAR to create Story Maps for their own projects. Dave Dickson has created one, called the **State of Low Impact Development in Connecticut** (see page 24), which describes the results of research done over the summer of 2015 by CLEAR’s NEMO Project on the use of “low impact development” practices in Connecticut towns. The Story Map not only tells a compelling story, but also can be used as a research tool by town planners and others, since the interactive maps provide direct links to various town documents that pertain to low impact development.

Cary Chadwick worked with CAHNR graduate student Mike Evans to create **The Bears are Back**, a Story Map on his research investigating the growing population and distribution of black bears in Connecticut (photo above, wildlife camera traps were set up at several sites to catch digital photographs of visitors to the site).

Emily has created another Story Map with Extension Educator Joel Stocker, called **Explore Connecticut’s Changing Shoreline**, which looks at historical changes to Connecticut’s coastline from 1934 to the present by carefully comparing historical and current aerial imagery. CLEAR’s Extension crew are confident that this new technology will help them to bring their research and outreach efforts to an ever-growing audience. **View all of the Story Maps at: clear.uconn.edu/storymaps.**



Making Healthier Homes

Article by Mary-Margaret Gaudio

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What do we mean by a *healthy home*? According to housing and public health experts, it is a home that is designed and maintained to support the health and safety of its residents. In his 2009 *Call to Action to Promote Healthy Homes*, the U.S. Surgeon General stated that by improving housing conditions—for example, by reducing hazards from lead poisoning, poor indoor air quality, environmental tobacco smoke, improperly stored household chemicals, and pesticide exposure—we can improve health outcomes for residents.

Healthy homes are particularly important for Connecticut families at risk. The state's housing stock is considerably older than the national average. Children living in older homes—especially children in low-income families, who face greater challenges of finding affordable, safe, and healthy homes—are most vulnerable to such housing-related health problems as lead poisoning and asthma. In 2013, according to the Connecticut Department of Public Health (DPH), more than 2,000 Connecticut children under the

age of six years were lead poisoned. Black children were twice as likely to be lead poisoned as white children; Hispanic children were 1.5 times as likely to be poisoned as non-Hispanic children. During the same year, an estimated 30,000 Connecticut children in grades 6 through 12 were reported as having an asthma episode or attack. Asthma rates, too, are disproportionately higher for Hispanics and blacks. Yet both lead poisoning and asthma attacks can be prevented or reduced, often by relatively simple methods.

In 2011, DPH issued its *Healthy Homes Strategic Plan*, which identified public education on such issues as a major goal. UConn Extension, often in partnership with DPH, has been active for decades in helping adults and children learn how to make their homes healthier and safer—by educating people about lead poisoning, radon, clean water, pesticides, and asthma, for example. Starting in 2011, a grant from the Children, Youth, and Families at Risk (CYFAR) program gave a multidisciplinary Extension team an opportunity to reach out to a previously untapped but important audience: urban youths, who not only are disproportionately affected by such problems as lead poisoning and asthma but also are capable—given

Photos right inset: Connecticut Department of Energy and Environmental Protection.

“UConn Extension ... has been active for decades in helping adults and children learn how to make their homes healthier and safer.”

appropriate guidance—of improving their own home environments in important but not necessarily difficult ways. This is a five-year, half million dollar grant supported by USDA’s National Institute of Food and Agriculture (NIFA) Children, Youth and Families at Risk (CYFAR).

While a great deal of material is available for adults and children (including materials previously developed by Extension staff and faculty), no comprehensive curriculum on healthy homes topics existed for school-age youths, particularly underserved urban youths. The Extension team designed and implemented an age-appropriate and culturally sensitive curriculum called *Tools for Healthy Living*. Since 2012 this curriculum has been taught at 12 4-H afterschool programs in Hartford and New Britain reaching approximately 350 youth.

Through this program, youths learn the principles of a healthy home: it is clean, dry, safe, free of pests and dangerous chemicals, in good repair, and with fresh air. A series of lessons helps them to understand the effects of problems such as lead poisoning, asthma, mold and moisture, pests, environmental tobacco smoke, and clutter, as well as to develop strategies they and their families can use to reduce or eliminate these problems. Youths also

explore the four key rules of food safety: clean, separate, cook, and chill. A final component of the curriculum is a lesson on self-advocacy skills, helping youths to become agents for positive change in their homes, schools, and larger communities. A long-term project to be completed by youths further encourages them to share what they have learned.

Site instructors, who are carefully trained to work with urban youth, deliver the program. The site instructors are given extensive background information, resources, and detailed lesson plans. The lessons use the 4-H experiential learning model to teach youths through hands-on learning, emphasizing critical thinking, problem solving, and decision-making skills. It incorporates the principles of positive youth development promoted by 4-H. Moreover, in addition to the lessons for youths, the curriculum includes take-home newsletters on each topic (in English and Spanish) so that youths can communicate important information to their families. Thus, urban youths, their families, and the larger communities can all learn how to make their homes as healthy and safe as possible. In 2015 *Tools for Healthy Living* was accepted as a national 4-H curriculum.

TOOLS & TRAINING



Casey’s Clean Air Week

As part of an outreach and education effort, the Connecticut Department of Energy and Environmental Protection (DEEP), along with UConn Extension’s Healthy Environments for Children Initiative, has developed a children’s book on air quality, titled Casey’s Clean Air Week.

The purpose of this book is to teach young children (approximately 4 to 7 years old) about the importance of clean air to protect both human health and the environment. The book advises children and adults of simple steps they can take to help prevent or reduce air pollution when using cars.

A companion guide and children’s activity book is available. The booklet includes suggestions for adults who read the book to children, activities for children to reinforce the educational messages in the book, and additional information about actions adults can take to improve air quality.

Printed copies of Casey’s Clean Air Week and companion guide were distributed to Connecticut public and private elementary schools, libraries, day care centers, and pediatric offices. A total of 11,070 books and 4,100 guides were distributed.

Any educators, library employees, or pediatric offices can request a printed copy of the book from the DEEP Bureau of Air Management’s Compliance Analysis & Coordination Unit at (860) 424-4152.



Auerfarm: Growing Opportunities

Article by Stacey Stearns

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The 120-acre 4-H Education Center at Auerfarm is a private, non-profit education center located in Bloomfield. Over 15,000 students and family members participate in year-round 4-H curriculum-based school science programs, animal clubs, and Junior Master Gardening projects annually.

Hartford entrepreneur and retailer Beatrice Fox Auerbach and her husband purchased the farm in 1925. Beatrice took control of the farm and managed it for 40 years when her husband died in 1927. Dairy, poultry, and apples were produced. At its peak, the farm was 230-acres, and honored in 1950 for its innovation and modern practices. The family of Beatrice Fox Auerbach deeded the farm to the Connecticut 4-H Development Fund in 1976.

A volunteer board of directors and staff run the farm's day-to-day operations and educational components. The partnership with UConn Extension brings the research from UConn to real life for visiting groups. Educational programs encourage critical thinking and curiosity through hands-on discovery in science and agriculture. Volunteers from the 4-H

program, Master Gardeners, and the community are a vital component of the farm.

Living Classroom

“We are very passionate about the mission of the organization, which is to connect people, agriculture, and the natural environment through education and recreation,” says Chairman of the Board Bob Lyle. “At Auerfarm we have a wonderful 120-acre outdoor laboratory for learning, and we focus on bringing young people and their families out for fun, hands-on lessons in science, technology, engineering, and math (STEM).”

“Youth learn about nutrition, food production, plant, and animal life,” Bob continues. “It’s gratifying to observe how participants enthusiastically react and enjoy learning in this kind of living classroom. We offer educational opportunities that many would not otherwise have.”

Through their experiences at Auerfarm, youth connect to their food environment while building a foundation in STEM education. Auerfarm recently finished construction of a new animal barn, and over the course of the year, the farm has many different species including alpacas, sheep, beef cattle, goats, pigs, chickens, and rabbits.

TOOLS & TRAINING

“We are very passionate about the mission of the organization, which is to connect people, agriculture and the natural environment through education and recreation.”



“The 4-H club at the farm works with the animals to further their understanding of various STEM-based concepts such as nutrition and animal health,” Hartford County 4-H Extension Educator Jen Cushman explains. “In addition, various school-based, summer programs, and birthday parties integrate the animals into their learning experiences. For example, enrichment programs highlight the life-cycle connections between chickens and eggs, baby animals, and the role that alpacas and sheep play in the creation of yarn.”

Science of Gardening

The Master Gardener/Foodshare garden is a quarter acre vegetable garden used as a demonstration site for learning the basics of environmentally responsible vegetable and flower production. Students learn about growing conditions through understanding management of soil, water, insects, and diseases.

Opportunities to watch seasonal progression of plants, as well as observation of birds and wildlife are available in the garden. Master Gardeners work with approximately 300 volunteers throughout the season. Each year, volunteers harvest over 3,600 pounds of fresh produce for distribution to the community kitchens through Foodshare.

An anonymous \$50,000 grant allowed the 4-H Farm to install a 20 x 48 polycarbonate rigid-walled greenhouse, which has space for in-ground and bench-top grow

ing. Classes and demonstrations are held in the greenhouse.

“It’s a sunny and green oasis during the winter months,” Hartford County Master Gardener Coordinator Sarah Bailey mentions. “Spinach and herbs grow throughout the winter, and as the season shifts, more varieties are planted. While heated, we run it as a cold house with minimal non-solar heat in the winter, yet it stays warm enough for several cold-hardy plants.”

The greenhouse expands growing space available, and extends growing seasons, allowing for more educational programs. Master Gardener volunteers are growing more plants for the Foodshare production garden in the greenhouse.

Sarah is the Junior Master Gardener program statewide coordinator, and utilizes the greenhouse to teach students how plants grow, science experiments, and techniques for planting and harvesting. Teachers receive instruction at the greenhouse, and take hands-on curriculum back to their schools. Sarah is also developing a multi-generational Gardening with Families series.

“I look forward to engaging current UConn students in the activities of Auerfarm through internships and service learning to expand the connection between Auerfarm and UConn,” Jen concludes. “By tapping the expertise of UConn Extension specialists, I anticipate enhancing the agricultural production and practices that occur on the farm.”

4-H National Youth Science Day

Each fall, UConn 4-H members in every county across Connecticut participate in 4-H National Youth Science Day (NYSD), which is the world’s largest youth-led science experiment. The hands-on experiment incorporates science, technology, engineering, and math (STEM).

Motion Commotion, the 2015 experiment, taught 4-H youth members about physics and speed, while addressing the serious public safety threat posed by texting while driving. By tying real life problems and their solutions to STEM, 4-H youth are engaged as problem solvers and gain hands-on experience in STEM, learn life skills needed to succeed today as well as career readiness for the future.

State 4-H Program Leader Maryann Fusco-Rollins and Joy Erickson from UConn’s School of Engineering had collaborated on a science experiment proposal for NYSD making it to the semi-finals. This collaborative experiment, Helping Hands Transforming Lives, challenges young scientists to become biomedical engineers for the day and design an Articulated Hand Prosthetic. It has been featured at 4-H Science Saturdays and will be featured at the Adventures in STEM workshop in November 2016. UConn Engineering students are mentors at Adventures in STEM.



Put Local on Your Tray

Article by MacKenzie White

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To our neighbors across the ocean, lunch in American schools is evidence of our culinary inferiority. The fact that one third of the nation's children are growing up overweight and obese leads many to point a finger at school food. But in reality, the age of sloppy joes and tater tots is steadily giving way to salad bars, sweet potato fries, and vegetable chili. Major changes and healthier regulations for school meals that began in 2014 have shifted the menu toward whole grains, less sugar, less sodium, and more vegetables and fruit.

In fact, school meals are a vital part of a federal child nutrition strategy that provides healthy food to children and helps fight hunger and obesity. With the new emphasis on healthier meals, a wave of innovative efforts to add fresh, locally grown ingredients have emerged across the nation. These farm-to-school initiatives typically include school gardens, field trips to farms, nutrition education, as well as menus that feature seasonal flavors.

In Connecticut, the *Put Local on Your Tray* pilot project (Tray Project) helps Connecticut school districts source, serve, and celebrate a different local food product each month. Led by UConn Extension

in close partnership with the Connecticut State Department of Education, the Tray Project has developed promotional materials to support school districts willing to feature one locally grown and seasonal product each month.

The Tray Project uses alluring and vibrant marketing materials including posters, stickers, and newsletter templates to educate the students about featured local foods. Using fun and engaging food puns such as “Kale, Yeah!—Don’t kale my vibe” or “Oh Snap!—I’m a Lean Green Bean Machine” have been key to generating a sense of fun and celebration around the new school lunch menu. The Tray Project assists participating school districts in building connections with local farms, sourcing local produce, and ensuring that cafeteria staff has what they need in order to process and serve fresh produce.

“This program has proved to be an invaluable component of our educational efforts at Middletown Public Schools to connect our students to local farms and agriculture while promoting overall wellness to enhance and maximize student achievement,” states Ava McGlew, MS, RD, CD-N, Food Service Director Middletown Public Schools.

Unlike similar ‘Harvest of the Month’ programs from other states, the Tray Project does not specify a month that each product should be used. This approach recognizes the true seasonality of produce

Photos, page 12, by Dana Stevens.

“When kids have an opportunity to learn and engage with fruits and vegetables in a positive way, they are much more likely to eat them.”

in Connecticut (e.g. kale is available from August through December in our state) and gives more flexibility to the school food service director who is making decisions about when to purchase and use a featured local ingredient.

Program Coordinator Dana Stevens and Outreach Coordinator Catherine Hallisey are currently working with four school districts including: Windham, East Hartford, Middletown, and Deep River. There are plans to expand to 15 districts for the 2016-2017 school year.

Over 2,000 students have participated in an interactive component of the program known as Local Tray Days. The Tray Project works with school districts to select one date for a cafeteria taste-test using kid-friendly recipes, and a second date, when the sampled local item is incorporated into the menu. Recipes include cider-glazed squash, kale chips, berry blast smoothies, and squash apple bisque.

“When kids have an opportunity to learn and engage with fruits and vegetables in a positive way, they are much more likely to eat them,” Dana explains. Students are asked to vote on what they thought of the local featured item. They can respond with one of the three options, tried it, liked

it, or loved it.

According to USDA, schools report that farm to school programs can increase the number of students purchasing school breakfast and lunch, improve consumption of healthier foods at school, and reduce plate waste. There are 187 school districts in Connecticut, and 74 percent completed the USDA Farm to School Census. Of those, 70 percent are currently participating in farm to school activities, and another 19 percent have plans to start in the future.

Programs like *Put Local on Your Tray* are an easy way to bring more local foods into the cafeteria. By focusing on one local product each month, farmers can plan ahead to grow the food needed, and food service directors can build that local product into school menus. More local foods in schools results in more support for our farmers. This means more of our dollars stay in the community, and local economies are strengthened.

The Tray Project is a component of UConn Extension’s outreach and education on sustainable food systems, led by Associate Extension Educator Jiff Martin.



TOOLS & TRAINING



FoodCorps

FoodCorps Connecticut recruits talented young leaders for a year of paid public service building healthy school environments in limited resource communities. FoodCorps members build school gardens, teach nutrition and cooking, and help bring locally grown ingredients into the cafeteria. FoodCorps is part of the AmeriCorps service network.

UConn Extension has been the state-wide host to FoodCorps since 2011. Jiff Martin serves as the State Supervisor and Chelsey Hahn is the State Fellow, based in the Tolland County Extension Center. The new service year begins in August and will see the program expand to 20 FoodCorps members, with a new state office to support operations, and a new advisory role for UConn Extension.

FoodCorps members are currently serving in the following school districts: Ansonia, Bridgeport, East Hartford, Hartford, Meriden, New Britain, New Haven, New London, Norwalk, Norwich, Rockville, Waterbury, and Willimantic.

The 15 FoodCorps members educated 14,670 youth about healthy, nutritious eating through 2,986 activities.





Wind Firm Forests

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ctforestry.uconn.edu

Driving down a Connecticut road with a canopy of green overhead delights Connecticut residents. But when a storm strikes, those same trees frustrate residents by blocking roads and causing power outages. Connecticut is the fourth most densely populated state in the union, and with 75% of the land covered by trees, power outages frequently occur. Tom Worthley, with team members in the Department of Natural Resources and the Environment (NRE), are working to make a difference with a program called “Stormwise.”

Stormwise is more than just a tree and forest management program, with a goal of making roadside forests more “wind firm.” Researching tree biomechanics is a key element of the Stormwise initiative, as is applying latest remote sensing technologies to understand landscape factors. A social science component of Stormwise helps develop appropriate outreach messages to stakeholder groups.

Stormwise vegetation management combines arboricultural and silvicultural techniques in innovative ways to address four key concepts. First, a tree with plenty

of space to grow is healthier. Second, trees crowns and branches develop toward light, and develop lean towards the power line corridor. Third, trees become stronger and more wind-resistant if exposed to wind as they grow. And fourth, growing the right tree in the right place is within our control. Roadside woods can be managed for natural resistance to wind damage through judicious thinning of unhealthy and unsuitable specimens, and providing desirable trees with plenty of space to grow in a balanced and wind-firm manner.

Vegetation Management

“When our society first started stringing wires on poles, the forest in Connecticut was young,” Tom says. “Wires on poles were okay, but now the forest is older, and taller and it’s never been managed, like an un-weeded garden on the roadside. The power infrastructure has not changed, but roadside forests have matured. We can manage roadside forests for the right species mix, age structure and density for wind-resistance, as an alternative to simply trimming or clearing trees away.” Tom conducts vegetation management trials and outreach. Each forest area is managed according to its individual characteristics,

“Each spot will be different, but we want fewer power outages caused by trees—our goal is to cut that number in half.”

with a focus on the four Stormwise principles. Answering questions like whether a tree will move differently if you give it space determines which trees are best for retaining in the roadside forest.

Three research sites study tree biomechanics, and eight sites have vegetation management projects. Fieldwork is being done at the UConn Forest, on state land in Coventry, on the UConn Torrington campus, on water company land in Orange, and with the Connecticut Agricultural Experiment Station (CAES) on a variety of sites in each county. North Haven and Haddam are conducting pilot projects in which wood from roadside tree removals is recovered for log or chip markets, with proceeds from sales benefitting the towns.

Graduate students have collected three years of data on the motion of trees using sensors. At other sites, students identify trees to preserve, helping to create a multi-age condition in the forest. Vegetation management work is being done with a crew of student labor.

Outreach

Public education about the need to manage roadside forests and plant shorter trees near power lines is a key part of the Stormwise mission. The challenge is the multitude of communities and stakeholders involved, including landowners, utility crews, elected officials and tree wardens. Everyone needs to be on board for

Stormwise to be effective.

“Power outages would be shorter with Stormwise management techniques,” Tom says. “And roadside woods could be managed from the ground every 15 to 20 years instead of from a bucket truck every 4 or 5 years.”

“My role is making connections for people, and providing technical assistance,” Tom continues. “For instance, I am teaching tree crews to look at trees for other product purposes.” The proceeds of timber sales can help to cover the cost of Stormwise management. Landowners and towns can also recoup costs.

As part of the public education process, Tom is working with social scientist Dr. Anita Morzillo of NRE to gather information about target audiences, and develop effective messages. They are seeking early adopters in communities to continue work with demonstration sites.

“The first big challenge was logistical work with the students as they tested management approaches,” Tom says. “Now Stormwise is ready to take to community groups.”

“In an ideal world, trouble spots will be converted into more wind resistant conditions,” Tom concludes. “Each spot will be different, but we want fewer power outages caused by trees – our goal is to cut that number in half.”

TOOLS & TRAINING



Stormwise, There's an App for That

Undergraduate students in the Department of Computer Science are developing a Stormwise app. The app will have two functions; tree failure reporting where individuals can provide a description and photo, and the app will walk people through a hazard tree assessment process.

Collecting tree failure data will be of great value for research down the road, and will help prioritize work. All data from the app will come back to UConn.

The app will be marketed to the public and other stakeholder groups when it is debuted later this year. Outreach audiences include elected officials and emergency management directors that make decisions about power and transportation networks in their community. Tree crews, tree wardens, and community stakeholders are also included.

The Stormwise website also offers information for various stakeholder groups, and the program has an active Twitter account.



stormwise.uconn.edu



Creating a **Food Safety Culture**

Article by Diane Wright Hirsch

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A report by the Centers for Disease Control (CDC) published in 2013 described the increasingly evident relationship between produce and foodborne illness: over a ten year period, from 1998 to 2008, produce was responsible for 46% of diagnosed foodborne illness where a source was determined. This often surprises consumers who normally consider meat and poultry the leading cause of foodborne illness.

But, researchers and regulators have been focusing on the safety of fruits and vegetables since 1998 when the United States Department of Agriculture (USDA) and the US Food and Drug Administration (FDA) jointly released the Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables, also known as Good Agricultural Practices (GAP). That voluntary program was the first of many aimed at addressing the growing number of illnesses attributed to produce.

Fast-forward a decade. Large outbreaks tied to spinach, sprouts, melon, and tomatoes continued to occur, despite the voluntary guidelines. Over time, larger retail customers and distributors began looking for

assurances that produce was being grown, harvested and packaged using food-safe practices. Some regional retailers and distributors now require suppliers of local produce to submit a third party GAP audit, which assesses compliance with GAP standards.

Extension Meets the Need

Farmers do not generally think of themselves as food handlers or processors. They have not had to submit to any kind of inspection or audit in the past to ensure that they were applying specific food handling standards to their operation. This can be hard to wrap their heads around.

Because produce safety and safe handling standards are new to just about everyone in the business, from farmers to retailers and regulators, training is essential to help farmers prepare for third party GAP audits. Most farmers in Connecticut have signed on with the USDA Agricultural Marketing Service (AMS) audit program. Mark Zotti of the Connecticut Department of Agriculture is trained and certified to conduct annual farm audits.

Extension's GAP School has offered training to produce farmers for over 10 years. Extension Educators Diane Wright Hirsch on food safety and Candace Bartholomew on pesticide education,

Photo, page 16 inset by Amanda Kinchla, UMASS.

“Because produce safety and safe handling standards are new to just about everyone in the business, from farmers to retailers and regulators, training is essential...”

conduct the course. Funding from the USDA Specialty Crops Initiative via the Connecticut Department of Agriculture has supported Extension produce safety efforts, with a total of \$83,279 awarded. One benefit of funding was a one-day course was developed for farmers to learn about safe produce handling and sanitation in their packinghouses, whether they are small outdoor spaces with a roof, or larger enclosed facilities.

The course is now two full days with new information and more complex GAP standards. In addition, farmers may meet individually with Extension educators to review their food safety plans.

The course begins with a review of foodborne outbreaks tied to fruits and vegetables and the relevant microbiology. It is easier to understand why these practices are important if farmers understand how consumers get sick from food they eat.

Farmers develop a farm description and conduct an assessment of water sources and irrigation systems. They learn about standards to pass an audit, which include addressing safety in irrigation water, manure use, sanitation programs for harvest utensils and equipment, worker health and hygiene, and ultimately post-harvest handling, storage, transportation, and maintenance of a clean packing facility.

Farmers write a food safety plan on how food safety practices are implemented,

and develop records to document practices. Aside from making capital improvements, writing a food safety plan can be the most challenging step to preparing for an audit. Templates and models are used to help farmers with writing a narrative description, and standard operating procedures (SOPs).

“UConn Extension has been invaluable in providing my farm with training to help us develop a farm food safety plan and implement a successful GAP program. Most of all, the training has really raised our awareness and commitment to food safety,” says Nelson Cecarelli of Cecarelli Farms in Northford.

Unfortunately, despite voluntary efforts, produce related outbreaks continued. As with other food commodities including meat, poultry, seafood and juice, legislation requiring many of the GAP guidelines was enacted. The Food Safety Modernization Act (FSMA), Produce Safety Rule was finalized in November 2015. Hirsch and Bartholomew have been providing information sessions to help farmers understand compliance and local exemptions of FSMA.

Andy Reale of Ferrari Farms in Glastonbury summed up his experience, “I have attended UConn Extension GAP, and now FSMA programs since their inception. The GAP sessions allow us to continue doing business with those that requested it, and now that will continue with FSMA.”

TOOLS & TRAINING



Collaborative Partnerships

Extension educators from throughout the Northeast consider collaboration essential to the success of their work with fruit and vegetable growers.

In 2012, regional food safety specialists from the Universities of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Cornell received a NEED-NERA (Northeast Extension and Experiment Station Directors) planning grant focused on coordinating efforts to address the safety of post-harvest handling of fruits and vegetables on small, diversified northeast farms. Recognizing the limitations of our individual resources, it only made sense to work together.

“The Northeast regional partners involved in food safety Extension programming have established a cooperative to better support our stakeholders,” states Amanda Kinchla, Extension Assistant Professor from the University of Massachusetts. “Over the past few years, we have been able to leverage resources and establish supports that help address critical food safety issues.”

Produce farmers have benefited from this collaboration as research-based information regarding use of agricultural water, produce washing and sanitation is shared and workshops, curricula and training videos and material are developed.



Water Solutions

Article by Stacey Stearns

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Irrigation and plant pathogens, or infectious organisms, in water are recurring themes for Rosa Raudales, an Assistant Professor of Horticulture and Greenhouse Extension Specialist. Rosa's first job was on a plantain irrigation project in Honduras. As an undergraduate, her thesis focused on pathogens in hydroponic systems, where plants are grown in a soilless system. Rosa researched biological controls, water treatments, and plant pathogen controls during her graduate studies.

At UConn, Rosa builds off the foundation she created; with applied research focusing on using low-quality water for irrigation, and developing management strategies to control microbes and unwanted chemicals in irrigation water. A holistic, multidisciplinary approach addressing biological, chemical and physical parameters of water quality is developed for each project. Rosa then delivers science-based information to growers, solving plant health and horticulture issues with efficient and sustainable practices.

A Smart-Resource Grid

An integrated research team from the College of Agriculture, Health and Natural Resources (CAHNR) is partnering with faculty from the School of Engineering on a project called Smart-Resource Grids: Exploring Technical Solutions to Grand Challenges at the Water-Energy-Food Nexus. The project is funded through the UConn Office of the Provost.

Richard McAvoy, Department Head of Plant Science and Landscape Architecture is project director. Rosa is one of 14 faculty members on the project, and water thrust co-leader with Tim Vadas from the School of Engineering. By building a smart-resource micro grid on the Storrs campus, researchers can study how water, food, and energy relate to one another and find synergistic relationships.

The UConn grant funds are developing infrastructure that demonstrates how wastewater can sustain agriculture. Reclaimed water will be used for irrigation and bio-solids from the wastewater will be used to produce energy. A gasifier owned by the School of Engineering will generate energy from the bio-solids in the form of natural gas. The gas can then be used to generate heat or electricity for use in the greenhouse, or the energy can be used someplace else where

TOOLS & TRAINING



“Using what is considered waste in other industries, as an agricultural input, puts less pressure on natural resources.”

demand is needed on the grid.

Connecticut regulations indicate that reclaimed water cannot touch the soil. Greenhouses can have closed-loop irrigation systems, which have zero runoff. Using reclaimed water conserves resources and allows treated water to serve a purpose.

“The broader application is in becoming more efficient on how we utilize resources,” Rosa says. “Using what is considered waste in other industries, as an agricultural input, puts less pressure on natural resources. We will also produce energy from solid-waste. Our team added the food component with the idea of designing the integrated cities of the future, where nothing is wasted. The project will give cities that already treat wastewater an option on how to use it safely, while growing food locally.”

Space and resources are limited in many areas, including food deserts, but there is often a water treatment facility. Food could be grown in these areas using technology and efficiencies developed by the UConn team. Economists on the project are researching feasibility and practical application.

“My role on this project is to evaluate how to grow crops effectively by balancing nutrition and preventing biofouling on the pipes,” Rosa mentions. “The outreach component consists on understanding how to facilitate adoption of our system and developing a system that is feasible for cities to integrate.”

Water Sources

The USDA Critical Agricultural Research and Extension (CARE) Project is a \$200,000 grant. Rosa is collaborating with Jeff McCutcheon from the School of Engineering, and Richard McAvoy and Michael O’Neill of CAHNR. The project looks at why horticultural farms are not using low quality water sources, and barriers for adoption (sidebar, at right).

Water quantity is a national priority. The Agricultural Water Security grant is co-sponsored by the Connecticut Natural Resources Conservation Service (NRCS) through the Regional Conservation Partnership Program (RCPP) and UConn Extension. Rosa collaborates with Michael O’Neill, Michael Dietz, and Angie Murdukhayeva of UConn Extension. Associate Dean Michael O’Neill is project director.

The RCPP project will identify how much water agriculture uses, and risks of different operations in the event of severe drought. During the first phase, the team is looking at how water is being used at operations. The second phase will develop drought management plans for different types of operations through technical support and financial assistance.

Rosa is applying for more grants to build off her current research. One thing is certain, as she continues to tie research to real life, the questions related to food, security, water conservation, and energy resources will be answered.

Hydroponics

Hydroponics is a growing area of agriculture that uses mineral nutrient solutions in a soilless system to grow plants. Rosa researches chemistry and water clogging of hydroponics in her greenhouse.

“With the CARE project, a set of growers in Connecticut have problems with low quality water clogging systems,” Rosa mentions. “Samples are being collected to see if we can find the parameters causing clogging.” Research being done will determine if the same water can be used without clogging the irrigation system.

Growers in Maine, Rhode Island, New York, and Connecticut are being surveyed for the project. Hydroponics usually starts with really clean water, and tying back to her other projects, Rosa hypothesizes that when using reclaimed water; there will be potential clogging challenges which tends to be a costly problem to farmers.

Another project researches using bio-controls in hydroponic systems to make water less conducive for pathogens, while increasing beneficial microbes in the water. Rosa is looking at adjustments to nutrients and temperature that will make the water less conducive to pathogens. This joint project with Dr. Wade Elmer at the Connecticut Agricultural Experiment Station is funded through the Connecticut Department of Agriculture Specialty Crop Block Grant Program.



Extension Volunteers

Article by Stacey Stearns

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Master Gardener Volunteer Tracy Burrell

We have 1,587 active Master Gardener volunteers in Connecticut. In 2015, they donated 34,555 hours of community service to towns and cities throughout the state, with an economic value of \$797,183. Master Gardener offices are in each of the county offices, on the Storrs campus, and the Bartlett Arboretum in Stamford.

Tracy Burrell of Mystic is a Master Gardener volunteer, and president of the Connecticut Master Gardener Association (CMGA), the Master Gardener alumni group. CMGA is a non-profit, all volunteer group that provides scholarships to interns, stipends to the UConn Extension Master Gardener Coordinators, and outreach grants for Master Gardener volunteer projects across the state. In 2014, Tracy also served on the UConn Extension Centennial Committee.

“I became a Master Gardener in 2008,” Tracy begins. “It was something that I was always interested in, and that year, I was finally able to do it. It is a gateway to a whole new world, and becomes all encompassing. You want to learn more and more. As your interests and skills change and develop, there is always someone that you can talk to in the program.”

Tracy continued taking classes and volunteering, and is a Ruby volunteer, the top level in the program. She is also a Master Composter, and an instructor in that program. Through her position as president of CMGA, Tracy works with all of the UConn Extension Master Gardener locations. “Meeting the people is my favorite part about being a Master Gardener,” Tracy says. “I travel regularly to all of the Extension Offices and to the Bartlett Arboretum— the energy and enthusiasm of Master Gardeners is wonderful!”

Reflecting on her own learning experiences through the MG program, Tracy cites learning about rain gardens as a prime example of learning to embrace the landscape, instead of trying to fight it, and being frustrated and disappointed.

“I grew up in a volunteer family; it is natural for me to volunteer,” Tracy concludes. “I think it is a natural part of the American character, as noted by Alexis de Tocqueville in his *Democracy in America* and more recently by President Obama encouraging folks to volunteer. Master Gardeners provide a unique bridge between the knowledge we learn via the university and the knowledge we gain from interacting with Connecticut’s citizens.”

Photo, page 20, Tracy Burrell, far left, with Rebecca Crosby and Rineicha Otero (photo by Dean Batteson). Photo, page 21, Marcia Johnson, second from left receiving the Agri-Science Award at the Big E. Photo, left inset: students at Hale School.

“It is a gateway to a whole new world, and becomes all encompassing. You want to learn more and more.”



4-H Volunteer Marcia Johnson

Twenty-eight years as an elementary school teacher has not dampened the enthusiasm of 4-H volunteer Marcia Johnson. She’s upbeat, energetic and clearly excited about teaching. Five years ago, Johnson created a school gardening program for her students at John Barry Elementary School in Meriden. When Johnson took a position at Meriden’s Nathan Hale School, she created the 4-H Environmental Education and Garden Club. She says, “I love the 4-H curriculum, and the kids really enjoy it.” In 2013, Johnson brought the Junior Master Gardener curriculum to her program, and a year later, she decided to complete the 4-H volunteer training so she might bring 4-H to students in her after-school and summer clubs. This year, thirty students joined the club from grades three, four, and five. High school students volunteer to assist with the program.

“I am by no means a gardening expert,” says Johnson. “I am learning along with the kids. For two years before we planted our first seed, I collected information on gardening curriculum at every grade level. I’m always searching online for gardening ideas. I would love to take the Master Gardener Program at UConn.” The students planted eight raised beds filled with strawberries, eggplant, zucchini and yellow squash, basil and green beans, in addition to a few annual flowers chosen to attract pollinators. Johnson added a hydroponic tower to house a lettuce crop. She uses the harvested produce to teach the children healthy cooking and food preparation. Students take produce home as well.

Umekia Taylor, associate extension educator with UConn Extension, was so impressed with Johnson’s program, she awarded the school a 4-H CT FANs *IM* mini grant that provided raised bed kits, curriculum materials and tools, as well as programming assistance. Over the summer, two 4-H CT FANs *IM* staff spent two days a week with Johnson’s students, providing fun activities that focused on gardening, nutrition, and fitness.

Johnson is continually looking for new club activities to provide experiential learning for her students. She brought in chicken eggs to incubate in the classroom, and set up honey tasting with a local beekeeper. Johnson never tires of working with her students. “It’s the best part of my day. The kids just love it and they never want to go home.”

Johnson received the 2013 and 2014 Connecticut AgriScience Award sponsored by the Connecticut Corporators to the Eastern States Exposition (The Big E). She is also the recipient of the American Farm Bureau’s White Reinhardt Award and received a grant from the Connecticut Agricultural Education Foundation.

“I can’t get over how fascinated the kids are to see things grow from a seed,” Johnson says. “We live in such a technological society where kids go to a restaurant and food suddenly appears. We rarely take the time anymore to teach children about nature.”

Article by Kim Colavito
Markesich

A longer version of
this article appears on
Naturally.UConn.edu

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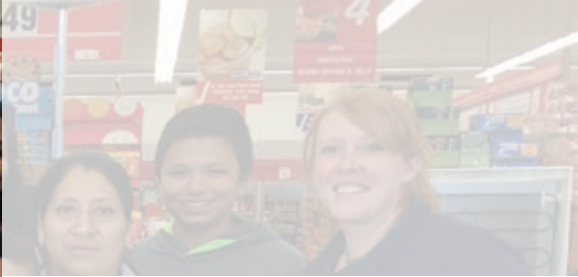
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Conversations Around Food

Article by Linda Drake

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Imagine running out of food, with small children to feed, and no food stamps for another week. Friday's paycheck has to pay your utility bill, or they will cut off your electricity. Feeling panicked yet? Picture what it was like, over 40 years ago, to have someone from UConn Extension knock on your door and ask if you need help learning how to feed your family for less.

Since 1969, Expanded Food and Nutrition Education Program (EFNEP) educators have been helping thousands of families and youth in some of the most challenged neighborhoods in Connecticut.

While parts of Connecticut are affluent, our state has deep pockets of poverty that can lead to food insecurity and hunger. Some of the poorest neighborhoods in the country are in urban areas of our state. Food deserts, or areas that lack access to grocery stores and fresh food, contribute to the problem. This includes urban centers as well as more remote rural areas where transportation is a major hurdle for accessing healthy foods. Coupled with the challenging economy, the state has seen an increase in the number of families with children using soup kitchens and food assistance.

During the 1960's, there was increasing awareness of the health problems associated with poverty. Hunger and poor nutrition were identified through several government studies. Cooperative Extension leaders recognized that programming was not reaching low-income populations as well as it could. In 1962, several states conducted pilot projects focusing on the best way to reach this audience with food and nutrition information. Throughout the mid 1960's, effective land-grant university projects helped to build administrative support for establishing a program within Cooperative Extension.

EFNEP is the oldest federal nutrition education program for low-income families, being formally established in 1969. The U.S. Department of Agriculture (USDA) National Institute of Food and Agriculture (NIFA) administers EFNEP at land-grant universities in all U.S. states and territories, and the District of Columbia. The program provides practical, hands-on food and nutrition education to tackle societal challenges such as hunger, malnutrition, poverty, and obesity.

UConn Extension has eleven EFNEP educators in communities throughout the state. EFNEP is active in cities such as Hartford, New Britain, New Haven,

Photo, page 22, touring the Danbury Price Rite during an EFNEP program (photo by Lynn Radford, Grassroots Academy).

“Interactive, hands-on sessions are used as much as possible. We have conversations with our clients, not lectures.”

New London, Willimantic, Bridgeport, and Danbury. Bilingual programs and materials, cooking classes, and educational trips to the grocery store are a few offerings.

Meeting Clients Where They Are

When the program first began, EFNEP educators did knock on doors to recruit participants. Today, EFNEP staff develop relationships with community-based organizations and agencies who work with low-income families and youth. One of the first pilot projects, in the 1960’s, was conducted in a Bridgeport housing project. Dr. Janina Czajkowski-Esselen directed this pilot project. She was one of the visionary thinkers who helped develop the concepts behind the EFNEP program.

There is a unique peer educator component in EFNEP, which has since been used in communities around the world. The program considers the situation of each participant, and tries to help them identify and determine solutions to their issues around food choices, shopping, feeding families, food safety, and food insecurity.

The program meets clients where they are, and considers economics, culture, and literacy in programs and materials. Educators use interactive, hands-on

teaching methods through conversations, not lectures.

Participants develop skills that can help them improve their food and nutrition practices for better health and quality of life. Depending on the situation of the family, this may mean just having enough food at home to last from payday to payday.

UConn EFNEP educators serve as a link between program participants and other local agencies, including federal programs such as Women, Infants and Children (WIC) or the Supplemental Nutrition Assistance Program (SNAP, formerly the Food Stamp program) that participants may qualify for.

In 2015, EFNEP reached 1,850 participants, and 2,089 family members. Since the program’s inception, over 48,000 families with more than 150,000 family members, and close to 200,000 youth have learned from educators about improving health and quality of life.

For more information about EFNEP, visit the NIFA website:

nifa.usda.gov/program/expanded-food-and-nutrition-education-program-efnep

TOOLS & TRAINING



Making an Impact

The nutrition programming through EFNEP has three components: healthy food and physical activity choices, making funds go farther, and learning skills to improve food preparation and food safety practices. Clients participate in four to eight lessons, meet with the educator at least four times, complete pre and post assessments, participate in food and nutrition activities, and practice their learned skills. Recipes are available in English and Spanish. During the program, participants taste new foods, acquire cooking skills, and learn about food safety and storage.

As part of healthy choices, clients learn about preparing healthy foods and nutritious snacks for various stages of the life cycle. Making funds go farther in the grocery store is a skill anyone can use. Extension educators help clients plan meals, make grocery lists, read labels, and shop wisely. UConn Extension educators toured the Danbury Price Rite with moms from Grassroots Academy, and taught them about saving money at the store while feeding their families healthier foods.

EFNEP has always included an evaluation component that measures food behaviors and dietary quality. Evaluations show the vast majority of EFNEP participants have made at least one improvement in their food choices. There is also an increase in the number of participants eating the recommended amounts of fruits and vegetables after an EFNEP program.



Low Impact Development in Connecticut

Article by David Dickson
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Connecticut towns are increasingly recognizing the impact of stormwater runoff on water quality. Low impact development (LID), also called green stormwater infrastructure, is a major strategy to address these issues. The Nonpoint Education for Municipal Officials (NEMO) program at the Center for Land Use Education and Research (CLEAR) has been working with towns on these issues since 1991. With NEMO's 25th anniversary looming and a major revision of Connecticut's stormwater regulations in the process of being finalized, NEMO, with the help of a UConn Extension intern, recently completed a 9-month study on the status of LID adoption in towns across the state.

LID is a broad strategy involving a number of stormwater practices designed to infiltrate runoff back into the ground, reducing flooding, erosion, and water pollution problems. These strategies include permeable pavements, green roofs, bioretention areas, and

other practices designed to reduce impervious cover. Some towns have updated their regulations to allow for or even require the use of these practices where feasible. Others however have lagged behind and actually have regulations that discourage or prohibit developers, often inadvertently, from pursuing them. NEMO's study sought to get a better handle on the progress made on this front.

The NEMO study had two phases. In Phase One, NEMO research assistant Manon LeFevre conducted exhaustive (and exhausting) internet research on the land use plans and regulations of 85 of CT's 169 towns (the number of towns was dictated by available resources and is not a scientifically random sample). Towns were "scored" for the number of LID strategies that appeared in these documents, based on the 14 specific practices suggested in the 2009 NEMO guide *Developing a Sustainable Community*. A guide to Help Connecticut Communities Craft Plans and Regulations that Protect Water Quality.

In Phase Two, follow-up phone interviews were conducted for the vast majority (78) of these towns by

TOOLS & TRAINING



“... the greatest driver of LID regulations at the local level are local champions ... efforts to educate and empower those audiences are still the most effective way of making LID commonplace.”

Manon and Kerrin Kinnear, an Extension Intern in the UConn Environmental Studies program. Kerrin and Manon doggedly pursued town planners and other municipal staff to ascertain the reasons why their town did or did not pursue LID, the greatest barriers they face related to this type of development, and if they had any recommendations for us.

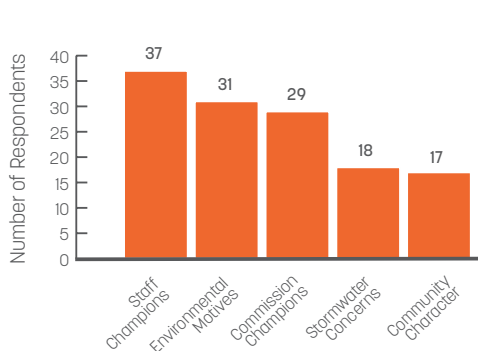
As NEMO educators have long thought, the greatest driver of LID regulations at the local level are local champions—either staff or land use commissioners. Thus efforts to educate and empower those audiences are still the most effective way of making LID commonplace (table, lower left).

On the barriers side, cost and lack of educational opportunities about LID were the top vote getters (table, lower right). However, many of the barriers can also be viewed as education issues. The cost category also encompasses perceptions that LID is more expensive, although that is not

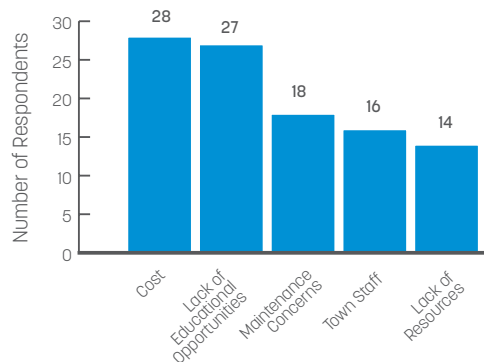
always the case and education about the true costs could help that. Reluctant town staff were also among the top vote getters for barriers, but education directed at those audiences may also help allay some of their concerns. Finally, long-term maintenance was often cited as an area of concern and more could be done through education and assistance to help address that.

In sum, the results of the NEMO LID study provide some useful information to help guide the future municipal assistance efforts of CLEAR, CT DEEP, and others. Most towns in Connecticut seem to have at least some language related to low impact development (LID) in their plans and regulations, largely due to the work of dedicated local proponents. However, not all of this leads to regulations outlining specific LID practices, and additional resources are needed, with incentive funding and education leading the list of needs. This project was partially funded by UConn Extension and CT DEEP.

Top 5 Motives for Implementing LID



Top 5 Barriers to Implementing LID



Explore the Results

In addition to reviewing the land use regulations of towns, the NEMO team created an interactive online “Story Map” allowing users to explore the data further (<http://s.uconn.edu/stateoflid>). The story map combines interactive maps, text, graphics, photos and other media to tell a more compelling story than could otherwise be done by a publication or website.

Through the story map you can review the recommend changes to local land use regulations and explore which of those are most (and least) common in CT. It also serves as a database of LID regulations in the state, allowing towns to search for where LID-friendly regulations have been adopted and link directly to the actual text and page number. Which makes stealing from your neighbors easy, productive and encouraged. So steal away.

Visit the Story Map

<http://s.uconn.edu/stateoflid>





A Foundation in 4-H

Solomon “Sol” Boucher of Tolland exemplifies the 4-H motto of making the best better. Sol has taken the foundation in leadership and citizenship skills developed through the 4-H program to a global stage, impacting his community, and a wider audience.

Article by Stacey Stearns

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In 2003, 10-year old Sol joined the Mighty Mix 4-H Club. Deb Couture and Felicia Johnson, his mother, served as co-leaders. Sol was elected president by his peers, and maintained the post through 2010.

The 4-H fair is a highlight of the year. Mighty Mix sold simple, historic toys such as Jacob’s ladders at the fair each year. In addition, Sol and his fellow club members set up and ran kids’ games, donating proceeds to the Tolland Soup Kitchen. Sol entered his photography in 4-H competitions, winning best of show at the State 4-H Photo and Art Contest in the junior division in 2005, and senior division in 2008.

Connecticut 4-H members hold demonstrations in the New England Center at the Eastern States Exposition, or Big E. The Mighty Mix attended for five years, the first two years demonstrating their wooden toys. Then, Sol had the idea to connect

a camera, laptop, drawing program, and printer. Club members took photos of interested fairgoers, converted them to computer-drawn likenesses, and printed them in black and white. Attendees could color the drawings, or take home the black and white version; it was a big hit for the three remaining years club members ran their booth.

Going Green at the 4-H Fair

Sol served on the Tolland County 4-H Fairboard from 2006-2010. The annual advertising campaign is critical to the success of the 4-H Fair. Members raise funds by soliciting advertisements from local businesses for the 4-H Fairbook. In 2009 and 2010, Sol was the highest salesperson, and inspired other 4-H members to sell more ads, then passed down his list of willing donors. He had a broad view of the 4-H program, and tackled numerous challenges throughout his service on Fairboard.

“Sol was dismayed by the huge amount of garbage at the 4-H Fair, and the absence of recycling,” Felicia explains. In 2008, Sol and fellow 4-H Fairboard member Alix Moriarty formed a green committee, and Sol asked his father, UConn Extension Educator Jude Boucher, to serve as advisor.

“The green committee initiated buying recyclable tableware and cutlery for the snack bar, and purchasing recycling bins to be placed beside every garbage can.”



“The green committee initiated buying recyclable tableware and cutlery for the snack bar, and purchasing recycling bins to be placed beside every garbage can. They included instructions about what could be recycled. At the end of the fair, Sol and Alix enlisted the Mighty Mix members and parents to sort through collected bags of recycling to separate out non-recyclables. It was a hot and dirty job, but they persevered,” Jude says.

The Green Committee held demonstrations about energy-saving strategies and products during the fair. Sol created a stand with illuminated LED, CFL, and incandescent bulbs connected to energy monitors that showed how much electricity each was using. He also had an outside table where fairgoers could play with toy solar cars.

Across Connecticut, people were talking about the green initiative at the Tolland County 4-H Fair. Sol and Alix gave an hour-long demonstration on living a green lifestyle at home, and steps one could take to make a local 4-H Fair green at the 2009 4-H Volunteer Conference, and again at the Association of Connecticut Fairs Convention in 2010. His peers recognized Sol with the 4-H Fair Exceptional Service Award in 2009.

A Bright Future

Gifted in computer science, Sol was a member of the RAGE Robotics team in high school, and shared his knowledge

with 4-H. He dedicated many hours each year setting up computers for entries at the Tolland County 4-H Fair. His robotics team brought their robot to the fair, and Sol arranged for an engineer to exhibit various solar inventions, and a Honda hybrid car modified to achieve over 100 miles per gallon.

He competed in Quinnipiac University High School Programming Competitions, and also volunteered to teach basic computer skills at the Tolland Senior Center. Sol graduated from Tolland High School as the salutatorian, and went on to Rochester Institute of Technology (RIT). The RIT computer science (C.S.) undergraduate program involves five years of study, including co-ops.

“Sol’s first co-op was as a research assistant for the RIT computer science department, writing code for robotic obstacle detection and avoidance,” Felicia says. Another co-op involved programming for a tech startup company in Rochester, New York, developing an encrypted “purse” for bit coins. “His subsequent co-ops were spent as a software engineering intern at Google, Inc., first based in Seattle, Washington during the summer of 2013, and later in Mountain View, California for the summer of 2014, and the spring of 2015.”

Sol studied in Croatia during the spring of 2013, was an honors freshman orientation mentor at RIT, a math tutor at the RIT Academic Support Center, and served

as an executive board officer in various capacities for the RIT C.S. Community. He also participated in C.S. programming competitions as an undergraduate. During two school breaks, Sol was in Quebec, studying and improving his French language skills. Staying true to his green 4-H roots, he led an effort resulting in the addition of recycling bins to every dorm kitchen throughout the university.

Sol graduated from RIT ahead of schedule, and received numerous awards while there, including the RIT Presidential Scholarship, RIT Outstanding Undergraduate Scholar Award, and the Norman A. Miles Award for Academic Excellence. The Miles Award recognizes a student entering his or her last year of academic study with the highest GPA across the university.

In 2015, Sol began a 6-year Ph.D. program in C.S. at Carnegie Mellon University in Pittsburgh, one of the nation’s top-ranked C.S. programs. Sol has helped a professor at Carnegie Mellon resurrect a Teacher’s Assistant Advisory Committee to support fellow graduate students that are also teaching. Showing his usual green outlook developed while in 4-H, Sol succeeded in getting the owners of his apartment complex to improve their recycling services. Sol demonstrates that youth who learn perseverance and develop self-confidence early in life can have a positive influence on the world around them wherever they go.



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