



THE CEFS CHALLENGE:

Sustainable Farms, Local Foods, Healthy Communities

20TH ANNIVERSARY
1994 - 2014

CEFS



CENTER for ENVIRONMENTAL
FARMING SYSTEMS

NCSU | NCA&T | NCDA&CS

www.cefs.ncsu.edu



WHAT IS CEFS?

The Center for Environmental Farming Systems (CEFS) is the nation's foremost center for research, extension, and education in sustainable agriculture and local food systems.

Founded in 1994, CEFS is a partnership of North Carolina State University (NC State), North Carolina Agricultural & Technical State University (NC A&T), and the North Carolina Department of Agriculture and Consumer Services (NCDA&CS). This founding partnership, along with the development of many other strategic partnerships, established a collaborative work ethic that is core to all of CEFS' work.



Goats enjoying the shade at CEFS' Goldsboro research farm.

Photo: Becky Kirkland/NC State

MISSION

The Center for Environmental Farming Systems develops and promotes just and equitable food and farming systems that conserve natural resources, strengthen communities, and provide economic opportunities in North Carolina and beyond.

LOCAL FOODS LEADERSHIP

CEFS has emerged as a national leader in the local foods movement, recognized for building consensus around action steps that can be taken to facilitate a vibrant local food economy. In 2008 and 2009, CEFS convened hundreds of food system stakeholders across the state in regional meetings, which concluded with a statewide summit, to develop "game changer" strategies to transform North Carolina's food system. These strategies, and other outcomes of the process, are detailed in *From Farm to Fork: Building a Sustainable Local Food Economy in North Carolina*, a comprehensive guide to statewide action.

The guide is hailed at the national level as a blueprint for statewide local food systems work, and most of its "game changer" ideas have now been implemented. In 2013, funded by the Blue Cross and Blue Shield of North Carolina Foundation, CEFS began work on the next iteration of statewide assessment and action planning: linking local foods to community health and other key economic, environmental, and societal impacts.



A teaching moment at CEFS' Small Farm Unit.

Photo: CEFS



Brainstorming "game changer" strategies as part of CEFS' collaborative, statewide Farm to Fork process.

Photo: CEFS

IT BEGAN WITH A FARM . . .



Young calves at CEFS' Pasture-Based Dairy Unit.

Photo: Callie Herron

In 1994, a small circle of leaders in sustainable agriculture came together with a single vision: to create a center for the study of environmentally sustainable farming practices in North Carolina.

A task force of university faculty and administrators, state and federal agencies, non-governmental organizations, farmers, and citizens was charged with developing strategies to build a strong sustainable agriculture program in North Carolina. Out of that effort grew the CEFS research facility, a 2,000-acre research farm in Goldsboro.

The farm became home to CEFS' core research programs and units. The Farming Systems Research Unit, Pasture-Based Dairy and Beef Units, Alternative Swine Unit, Organic Research Unit, and Small Farm Unit all provide research opportunities for faculty, graduate students and visiting scientists, and educational opportunities for farmers, extension agents and students.

Thriving apprenticeship and internship programs grew to attract students from across North Carolina and around the globe, training the farmers who will feed future generations and the students who will become tomorrow's food system leaders.

Building on its initial successes, CEFS broadened its focus to include community-based food systems and local food supply chain development. CEFS formed NC Choices to promote the advancement of local, niche and pasture-based meat supply chains. CEFS partnered with community organizations to support youth engagement and leadership development initiatives in areas most affected by food system inequities. New educational programs – including NC A&T's Discover Ag and NC State's Agroecology Program – were developed to reach students from elementary school through college.

Extension and outreach programs – including the Seasons of Sustainable Agriculture workshop series, Farm to Fork picnic, and Annual Sustainable Agriculture Lecture – were designed to engage the public on a variety of food systems topics, from basic sustainable agriculture practices like cover cropping to ways of addressing inequities in our food system. Now these programs reach over 2,500 people each year.



CEFS continued to evolve, focusing its attention on the potential statewide economic impact of supporting and increasing the market for local foods. The hugely successful NC 10% Campaign was born, encouraging all North Carolina individuals and businesses to commit 10% of their existing food dollars to locally-grown and produced foods. Within its first three and a half years, the Campaign signed on over 6900 individuals and 890 businesses, and tracked over \$54 million in local foods purchases.

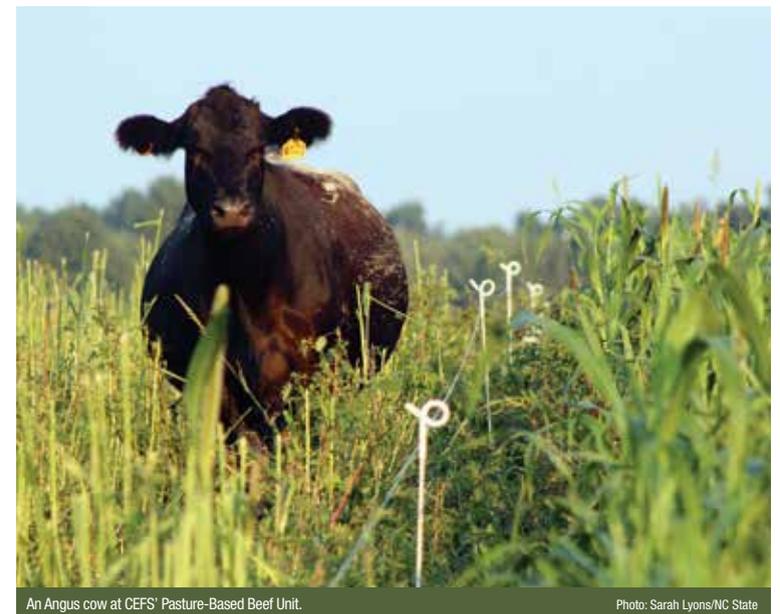
Realizing that policy changes were needed to support the growth of local foods, CEFS provided founding leadership to the North Carolina Sustainable Local Foods Advisory Council, a statewide legislated body established as one of the "game changer" outcomes of the Farm to Fork Action Plan. The statewide council stimulated interest in local county-based and regional food policy councils, and more than 29 such councils were in development throughout the state by late 2013.

CEFS' existing programs grew, and new programs developed. The CEFS research farm cemented its reputation for top-notch interdisciplinary and systems research, addressing the major agricultural sustainability issues of our time. New youth engagement and leadership development initiatives including Students Working for an Agricultural Revolutionary Movement (SWARM), Food Youth Initiative, and Produce Ped'lers supported the development of an experienced collective of young leaders in the local and sustainable food system movement.

As diet-related diseases like obesity and diabetes emerged as national epidemics, CEFS turned to the health impacts of increasing access to local, fresh produce. CEFS partnered with 4-H to host FoodCorps North Carolina, an AmeriCorps-modeled public service program that places service members in public K-12 schools across the state. Working in partnership with local communities and organizations, FoodCorps aims to change children's attitudes and behaviors towards food through nutrition education, school garden engagement, and increasing access to healthy, local produce through local farm-to-cafeteria pathways.



NC Choices vastly expanded its reach and impact, providing networking opportunities, educational programming – including the nation's first statewide conference solely dedicated to local, niche meat value chains – and technical assistance for hundreds of producers, meat processors, buyers, and food professionals throughout the Southeast. Building on NC Choices' success, CEFS incubated Firsthand Foods, a food hub-modeled business that aggregates, distributes, and markets local, pasture-raised beef and pork products from a network of more than 40 livestock producers.



An Angus cow at CEFS' Pasture-Based Beef Unit.

Photo: Sarah Lyons/NC State

DR. JOHN M. O'SULLIVAN

CEFS Director from NC A&T

“CEFS is unique: a dedicated group of people doing research to better understand sustainable agriculture production and marketing systems, as well as a network of people trying to rebuild healthy local food systems, from farm to fork. Rooted in its founding partnerships, CEFS has been able to grow its work by building great relationships with non-profit organizations, local communities, and food system leadership across the state.”



Photo: Becky Kirkland/NC State

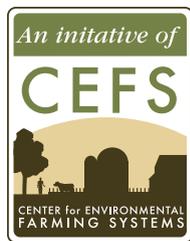


Photo: NC State CALS Communications

DR. NANCY G. CREAMER

CEFS Director from NC State

“As we celebrate our twentieth anniversary, it's inspiring to look back at the impact CEFS has had, while at the same time envisioning our work going forward: creating a future of vibrant farms, sustainable ecosystems, thriving communities, healthy people, and robust local economies.”



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NC GROWING TOGETHER

Connecting Local Foods to Mainstream Markets

Recognizing the need to “scale up” local food production, CEFS assumed a statewide leadership role in local food supply chain development. The NC Growing Together project, funded by the USDA's National Institute for Food and Agriculture, was initiated to bring more locally-produced foods – including meat, dairy, produce, and seafood – into mainstream retail and food service supply chains. The project, which focuses on retail grocery and military base models, has dozens of statewide partners including Lowes Foods and Fort Bragg US Army installation.

What began as a vision in 1994 has grown into a movement that is shaping agriculture across North Carolina and the nation. In the twenty years since its founding, bold and innovative programmatic initiatives have expanded CEFS' footprint beyond the boundaries of the research farm, reaching every corner of North Carolina and forming deep partnerships in local communities.

CEFS' 20TH ANNIVERSARY: 1994 - 2014

Today, the Center for Environmental Farming Systems flourishes as one of the nation's most important centers for research, extension, and education in sustainable agriculture and community-based food systems. It is recognized as a national and international leader in the local foods movement, and is celebrated for its work in building consensus around policies, programs and actions that facilitate a vibrant local food economy.



CEFS' 2012 Field Day attendees examine organic canola plants in the Organic Research Unit of CEFS' Goldsboro research farm. Photo: Becky Kirkland/NC State

CEFS' successes have not gone unnoticed: in 2012, CEFS was named a regional winner of the C. Peter Macgrath Community Engagement Award, a national distinction which recognizes outreach and engagement partnership efforts of four-year public universities. In 2012, CEFS was also awarded the USDA Secretary's Honor Award – the most prestigious departmental award presented by the Secretary of Agriculture – for “assisting rural communities in creating prosperity so they are self-sustaining, repopulating, and economically thriving.” CEFS was the only group outside of USDA to receive the award.

CEFS was born from the shared conviction that a land-grant-university-based research, education, and extension program focused on organic and sustainable agriculture could have a significant and essential impact in North Carolina. Now, twenty years after its founding, CEFS is reflecting on the impact it has made on the state of North Carolina and beyond.

We are celebrating our successes, honoring those who helped shape CEFS along the way, and looking ahead to the next twenty years. Let us tell you a bit of our story – and you'll discover how you can be part of a sustainable future.

“Y'all are red hot. You are beginning to change the tide, directing the links between local agriculture, jobs and the economy.”

- Former North Carolina Governor Beverly Perdue



Then-NC-governor Beverly Perdue addressing the 400+ participants at CEFS' Farm to Fork Summit, May 2009. Photo: Becky Kirkland/NC State

DR. CARY RIVARD: Rooted at CEFS, Trained for National Impact

Dr. Cary Rivard has always enjoyed eating tomatoes, but he also has a unique perspective on what it takes to grow them. A 2010 doctoral graduate of NC State University's Department of Plant Pathology, Rivard's research with Dr. Frank Louws helped popularize the use of tomato grafting as a propagation method in the United States. Grafting, which has been used for centuries in apples and other fruits, involves joining the shoot of one plant to the roots of another to create a new plant which combines the best traits of both "parent" plants. The technique offers important disease-resistance benefits for growers, especially organic growers who do not have chemical options to control plant disease outbreaks in their fields and high tunnels.

Cary first came to CEFS as a Summer Sustainable Agriculture Program Intern in 2002. "It was a great experience," he says. "Coming out of the Midwest, I didn't have a lot of experience in commercial vegetable production, and I had some experience of sustainable agriculture, but not much. For me, the benefit of my experiences at CEFS was in understanding the application of science to the practice [of sustainable agriculture]." Cary immersed himself in the range of internship activities, from hands-on farm work to assisting university researchers to engaging in food systems projects with the Goldsboro community.

As an undergraduate, Cary knew that he wanted to go to graduate school but admits that he "had no idea what that would look like." The summer spent at CEFS gave him "a really detailed overall understanding of what was going on in sustainable agriculture, and sustainable agriculture research. It was eye-opening – it gave me a much better sense of the interaction that occurs between a research institution and growers, and how I could contribute as a graduate student."

Two years later, when Rivard was applying to graduate schools, he found himself returning to NC State. "It was really the opportunity to work with CEFS that drove me to come back," he says. Rivard began working with Dr. Frank Louws in Plant Pathology, earning first his master's degree and then his Ph.D. His research on tomato grafting earned him top honors in the university's Graduate Research Symposium in 2009.



NC A&T's Dr. Keith Baldwin (retired) and Grace Summers examining tomato foliage as part of a workshop on high tunnel tomato production at CEFS' Small Farm Unit. Photo: Lisa Forehand/CEFS

The high tunnels – unheated greenhouses that allow for season extension in fruit and vegetable production – that Cary helped build at CEFS' Small Farm Unit are still used for important horticultural research. Dr. Sanjun Gu, an extension horticulture specialist with the Cooperative Extension Program at North Carolina Agricultural and Technical State University (NC A&T), has begun a three-year study to create a high tunnel vegetable calendar to help advise producers on what, and perhaps more importantly, when, to plant in their high tunnels. When completed, it will be a valuable resource for growers across the state who are increasingly looking at high tunnels as a way to help meet year-round demand for local produce.



Dr. Cary Rivard



Tomatoes ripening on the vine at CEFS' Small Farm Unit.

Photo: Lisa Forehand/CEFS

"The experiences I had at CEFS with multi-disciplinary teams and groups of researchers helped prepare me for my career in academics. I also learned a lot about sustainable agriculture and how to effectively use sustainable practices in production, which has been important for helping our growers."

- Dr. Cary Rivard

As for Dr. Rivard, he is now the Fruit and Vegetable Extension Specialist at Kansas State University's Department of Horticulture, Forestry, and Recreation Resources. He credits CEFS with laying the groundwork for his success in building sustainable agriculture programs in Kansas. "The experiences I had with multi-disciplinary teams and groups of researchers helped prepare me for my career in academics. I also learned a lot about sustainable agriculture and how to effectively use sustainable practices in production, which has been important for helping our growers."

When asked what CEFS' greatest asset is, he doesn't hesitate. "The people who make [CEFS] up, at all the different levels – the researchers, graduate students, NC Department of Agriculture folks, faculty – for me that's what it was all about."



Tomato plants in high tunnels at CEFS' Small Farm Unit.

Photo: Lisa Forehand/CEFS

SWARM: Youth Food Activists Are Changing the World

It was June 2011, and Wayne School of Engineering rising senior Kebreeya Lewis was standing before the Goldsboro City Council and Mayor Alfonzo King, presenting an impassioned argument for why students at her high school deserved to have a salad bar in their school cafeteria. Kebreeya's request had already been turned down by the county school nutritionist, but she had decided not to take "no" for an answer.

Kebreeya created a petition that was eventually signed by over 200 people, and now she was presenting her case to Goldsboro city officials. Impressed, the City Council wrote her a letter of support. Eventually, the county nutritionist was convinced: the salad bar was installed, and students' eating choices expanded from mostly pizza and french fries to fresh lettuces, tomatoes, carrots, and other vegetables. Kebreeya's inspiring success was chronicled in an HBO documentary entitled *Kebreeya's Salad Days*, part of their series *The Weight of the Nation*.*

As impressive as Kebreeya's victory is, it is just one of several remarkable accomplishments that has come of out a small group of Goldsboro youth food



SWARM and other youth at a youth empowerment-focused event of the Clinton Global Initiative Annual Meeting, September 2012. Current and former SWARMers include Demarcus Williamson (kneeling right), Zion Culley (standing fourth from right), Akira Bryant (third from right), and Jessica Davis (second from right). Photo: Clinton Global Initiative

activists called SWARM. With guidance from group facilitator Shorlette Ammons, CEFS' Community-Based Food Systems Outreach Coordinator, Students Working for an Agricultural Revolutionary Movement (SWARM) has been applying the lessons of past civil rights and justice movements to the struggle for food equity.

Shorlette, who is based out of the Cooperative Extension Program at North Carolina Agricultural and Technical State University (NC A&T), explains: "As a historically black land-grant institution, NC A&T has a rich legacy centered around civil rights, agriculture and food. Doing this work with SWARM is a great opportunity to build on that legacy as we work to create the next generation of food system leaders. We know that inequities in our food system affect all of us, especially our young folks. SWARM youth are an example of how we can build leadership in our most affected communities and work to shift that paradigm, just as the four NC A&T students did at a lunch counter in Greensboro in 1960."

It is a brisk fall day, and the current SWARM crew is having a planning meeting at the Wayne County Library. "We need to think about the next generation of SWARM," says 17-year old Zion Culley, who has been part of SWARM for almost two years. The current crew, all seniors in high school, will be moving on after graduation. Smiling, Zion says to Shorlette, "Don't worry. We're not gonna leave you here without recruiting new SWARMers."

Zion was part of a SWARM delegation invited by Blue Cross and Blue Shield of North Carolina (BCBSNC) to speak at a youth empowerment-focused event hosted as part of the Clinton Global Initiative Annual Meeting in 2012. "That trip taught me a lot about how to convey a message to people. I wanted to inspire the people there, and show them that youth aren't just sitting around doing nothing," he says.

Kathy Higgins, BCBSNC vice president, believes he delivered. "There was nothing more inspiring and more genuine than hearing from Zion and other youth about their commitment to changing the world around them and learning first-hand about their impact on the ground in North Carolina and beyond," she says.



Kebreeya Lewis at NC Central University, in front of vegetable beds her student group, BOOM, helped plant. Photo: NC Central University Office of Public Relations



The 2013-2014 SWARM crew: Zion, Destiny, Kamrie, and Zyon (L-R).

Photo: JJ Richardson/CEFS

"I'm teaching others about eating healthy and trying to change the world. When you learn from people who care about what they eat, it impacts everything. It all comes down to food. Everyone can relate when it comes to food."

- Kebreeya Lewis

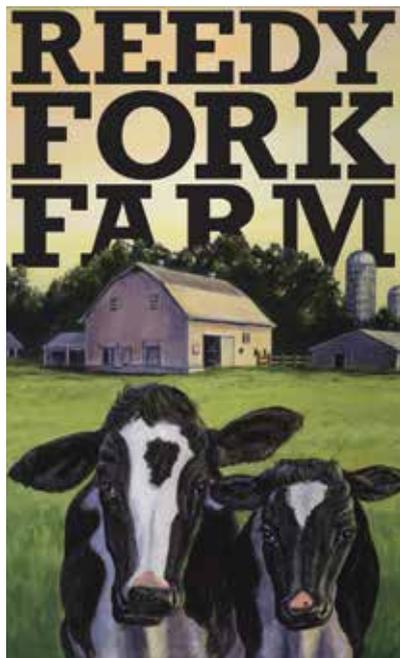
The power of effective communication is a theme echoed by several other SWARMers. Destiny, also 17 and the group's self-appointed spokesperson ("I do enjoy getting out and talking to people about SWARM!") says that the best thing about SWARM is learning how to convey their message. "We're actually trying to fix the food system," she says.

In addition to practicing leadership, advocacy and organizing skills, SWARMers gain hands-on experience in food production, working alongside CEFS interns and apprentices at the Small Farm Unit, and with children, peers, and elders in various community gardens around Goldsboro. The SWARMers acknowledge that it is hard work, but are quick to point out that it is one of the most rewarding things they do.

As for Kebreeya, she has since graduated from high school (and SWARM), and is a student at NC Central University. She started a student group called BOOM – Building Our Own Movement – whose mission is to teach about the importance of healthy eating through gardening, workshops, events, field trips, and community service. Kebreeya says that she first learned about healthy eating through SWARM. "I care about what I eat now, and I'm teaching others about eating healthy and trying to change the world. When you learn from people who care about what they eat, it impacts everything. It all comes down to food. Everyone can relate when it comes to food."

*Watch *Kebreeya's Salad Days* online at <http://theweightofthenation.hbo.com/films/kids-films/kebreeyas-salad-days>

GEORGE TEAGUE AND REEDY FORK DAIRY FARM: An Organic Legacy



George Teague's Reedy Fork Organic Farm sits on 500 acres of rolling pastures and woodlands outside of Elon, in Guilford County. George is the fifth generation of his family to work this land, which was in tobacco production until his father decided to turn it into a dairy in the 1950's. The dairy supported the family for several decades, until changes in agriculture brought hard times. Confronting escalating input costs and declining milk prices, the Teague family faced an uncertain future. Explains George, "I looked into every different thing to keep this farm going. The advice [to dairy producers] at the time was 'get bigger or get out.' I wasn't interested in milking five to six hundred cows, and we didn't want to develop [the land]. Organic was the best fit for us."

It was on a Farm Tour organized by CEFS' Pasture-Based Dairy Unit Coordinator Dr. Steve Washburn that George decided to go organic. "We were on a Dairy Farm Tour up to Pennsylvania and Maryland, and we visited five organic dairy farms. Four of the five farms had their kids coming back to farm or already back. That was a sign of the future: people can tell you anything, but if their kids are working on the farm [you know it's profitable]. That tour changed everything, it really did. I came back gung-ho ready to go organic."

Once the farm was certified organic in 2007, the family realized that to make their system work economically, they needed to mill their own organic grains. Armed with various loans and grants, they built an organic grain mill right across the road from

the house that George's great-great-grandfather had built. Now they sell 100 tons a month of mostly North Carolina-grown milled grains to local dairy farmers, backyard and small-scale farmers – even pet stores – across North Carolina and as far away as Georgia, Alabama, and Florida. "We've benefitted from CEFS' Organic Grains work as well," explains George. Dr. Chris Reberg-Horton, CEFS Assistant Director of Collaborative Research, directs the NC State Organic Grain Project, which works with farmers to increase organic grain production throughout the state. Increased supplies of North Carolina-grown organic grain means that George imports less and less grain from other states.



Reedy Fork's cows on pasture.

Photo: Reedy Fork Organic Farm

"CEFS is the only place doing this kind of work. There's not anybody else in our climate and region doing research for us."

- George Teague, Reedy Fork Organic Farm



George Teague at home on the farm.

Photo: JJ Richardson/CEFS



Bags of farm-milled organic feed ready to be shipped out.

Photo: JJ Richardson/CEFS

George has also been involved in various research projects at CEFS' Pasture-Based Dairy Unit. Reedy Fork Organic Farm is helping to pilot test the "CowVac," a vacuum-powered walk-through fly-trap that removes harmful horn flies from cattle as they pass through. They've had it for two seasons, and George says it's "working well." Developed at the Dairy Unit, the CowVac is now marketed commercially and is also used by conventional dairy producers to reduce pesticide use on their farms. The Teagues will also be involved in testing a portable irrigation system that the Dairy Unit is developing to help cool cows on pasture. "CEFS is the only place doing this kind of work. There's not anybody else in our climate and region doing research for us."

These days, George manages a herd of 100 cows, which spend their days grazing on intensively-managed pasture. George says he learned a lot about managing the pastures from CEFS' workshops and pasture walks. "It was a huge learning curve," he admits. Despite the big learning curve, there is no doubt in George's mind that the changes have been for the better. While in the past George says that he practically chased the younger generations of his family away from the farm, his farm now employs five people in addition to George and his wife, including George's son and nephew. And if George has his way, his family will continue at Reedy Fork for generations to come. It is a legacy he has fought hard to preserve.



Reedy Fork Organic Farm is part of the Organic Valley cooperative of dairy farms.

Photo: JJ Richardson/CEFS

LOWES FOODS AND ARIEL FUGATE: Bringing Local Foods to Retail Markets

If you've walked into a Lowes Foods store recently, perhaps you've noticed it: North Carolina products – tomatoes, strawberries, sweet potatoes, fish, pasture-raised pork, honey – throughout the store. The Winston-Salem based, family-owned grocery chain and its sister company, Merchants Distributors, have always been committed to buying and distributing locally-grown and produced items. Recent efforts are building on this commitment and allowing Lowes Foods – which operates 95 stores in North Carolina – to expand and promote locally-sourced products throughout their stores.

Lowes Foods was already purchasing in-season, locally-grown fresh fruits and vegetables in their North Carolina stores when it joined CEFS' NC 10% Campaign in March 2012. The NC 10% Campaign aims to support a statewide local food economy by encouraging all individuals and businesses in North Carolina to spend 10% of their existing food dollars on locally-produced foods. At the time, Lowes Foods Produce Director Richard McKellogg said, "Our commitment to buying local has not wavered, nor do we view this as a trend. Each year we continue to focus more of our resources toward this initiative to support our local neighbors."



Former USDA Deputy Secretary Kathleen Merrigan (second from left) with Ariel (center) and other students integral to the founding of the Campus Farmers Market at NCSU, February 2011. Former Deputy Secretary Merrigan visited CEFS as part of her "Know Your Farmer, Know Your Food" College Tour. Photo: Becky Kirkland/NCSU Ag Communications

Now, as a major partner of CEFS' NC Growing Together initiative, Lowes has made a commitment to modifying their supply chains and buying practices to source more local products from the state's small and mid-sized farmers and fishers. NC Growing Together unites dozens of partners statewide to bring more locally-produced meat, dairy, seafood, and produce into North Carolina's mainstream retail and food service supply chains, including those that serve Lowes Foods and Fort Bragg US Army installation.

"Our partnership with CEFS and NC Growing Together has helped us facilitate a consistent channel in reaching out to producers of all sizes across our state. The effort has shown an immediate impact not only in our local offerings but also in being able to really support those families and individuals who work and shop in the communities in which we operate."

- Richard McKellogg, Lowes Foods Produce Director

Working with CEFS and other NC Growing Together partners, Lowes added over 30 farms as vendors delivering direct to stores in 2013, tripling direct-to-store produce purchasing from 2012 levels. Local seafood and meat sourcing increased as well, including North Carolina flounder and shrimp, heritage breed pork chops and other high-value meat cuts. CEFS initiative NC Choices has played a pivotal role in facilitating the entry of local meats into Lowes' supply chains.

Says McKellogg, "Our partnership with CEFS and NC Growing Together has helped us facilitate a consistent channel in reaching out to producers of all sizes across our state. The effort has shown an immediate impact not only in our local offerings but also in being able to really support those families and individuals who work and shop in the communities in which we operate."



Ariel Fugate

Photo: Marc Hall/NC State University

NC GROWING TOGETHER AND FORT BRAGG

NC Growing Together is working to increase local food sourcing at Fort Bragg, the Fayetteville-based home of the US Army Airborne and Special Operations Forces.

NC Growing Together partners, in collaboration with the dining and catering services at Fort Bragg, have designed three objectives for increasing procurement of local foods on base:

- **Modify dining facility and catering menus to reflect North Carolina seasonality and local foods availability**
- **Train chefs at Fort Bragg in how to incorporate local foods into menus in an institutional setting**
- **Identify existing and establish new supply chain opportunities through which local producers can link to the base's food service providers**

At the front lines of Lowes Foods' local produce purchasing is Ariel Fugate, an NC State University graduate who now works for Lowes as their Locally Grown Accounts Representative, and NC A&T as liaison to the NC Growing Together project.

Ariel's path to local foods began during her freshman year at NC State, when she discovered the CEFS-affiliated undergraduate Agroecology program. "I had to switch [majors]," she says. "I had never studied something so interdisciplinary before. I was really drawn to the fact that we were studying systems instead of just one piece." CEFS Assistant Director for Educational Programs Dr. Michelle Schroeder-Moreno was one of Ariel's mentors, and helped her design a degree in Interdisciplinary Studies that focused on the three pillars of sustainability in food systems – economic, social, and environmental.

With Dr. Schroeder-Moreno's encouragement, Ariel and other students established the Campus Farmers Market at NC State, which is now entering its sixth year. "That brought together all the pieces of sustainability, and really allowed me to apply what I was learning," says Ariel. Her interactions with CEFS faculty had a lasting impact. "Dr. Schroeder-Moreno really stands out because she really values student input and tries to involve students in everything. It seems as though everyone at CEFS feels that way – that there's no point in doing what we do if we don't involve young people."

Now, Ariel is poised to complete the transition from student to mentor: she will be supervising three Lowes Foods local foods interns sponsored by the NC Growing Together project. The interns will learn about sourcing local foods for a major retail chain, and help develop best practices for in-store displays of local foods. Says Ariel, "Having started as intern under Richard McKellogg, I appreciate his patience as I learned to navigate a retail scale beyond the campus market. I am looking forward to mentoring interns as he did with me and helping to incorporate their fresh ideas into Lowes Foods stores."



A Lowes Foods display highlighting local produce and other offerings.

Photo: Ariel Fugate/Lowes Foods

FOODCORPS NORTH CAROLINA AND FARM-TO-SCHOOL: A Recipe for Healthy Kids



Watering the greens at Oak Hill Elementary's school garden.

Photo: JJ Richardson/CEFS

Sitting around a table at a regional sustainable agriculture conference, North Carolina's FoodCorps service members exude youthful optimism. They are discussing what attracted them to FoodCorps – part of the AmeriCorps network of service programs – out of all the many options available to them. “I knew I wanted to do service,” says Eliza Hudson, who is in her second year of FoodCorps service in Guilford County, “and a lot of other programs didn't have as much direct experience with kids. I wanted to be in classrooms, outdoor classrooms, sharing my passions with them.”

Leah Klapproth, a FoodCorps fellow who is in her third year of service, adds, “I feel more like a firestarter here. We're getting things started in Title I schools where there is a real need for resources, and so much possibility in terms of what can be done [with school gardens and nutrition education].”

FoodCorps is a national program whose mission is to “give all youth an enduring relationship with healthy food.” Working in partnership with local communities and organizations, FoodCorps aims to change children's attitudes and behaviors towards

food through nutrition education, school garden engagement, and increasing access to healthy, local produce through local farm-to-cafeteria pathways.

CEFS and NC 4-H co-host FoodCorps in North Carolina, providing training and support to seven FoodCorps service members and one FoodCorps fellow in six sites throughout the state. FoodCorps intentionally directs its efforts toward Title I schools, defined in North Carolina as public schools with a student poverty rate of more than forty percent. In Guilford County, the program is in its third year, working in partnership with the Guilford County Cooperative Extension Service (CES) at nine High Point Title I elementary schools.

Guilford CES Horticulture Agent Karen Neill has been part of developing the FoodCorps program since the very beginning, and has personally seen its benefits: “Kids are engaged, test scores are up, kids have a much greater appreciation of where food comes from. They've learned life skills – they know how to improve and amend soils, they understand seasonality.”

Arguably, the most significant benefit is that the program impacts what kids are *eating*. Various research studies have shown that children are much more likely to try a new food if they have helped to grow it. And that is proving true in Guilford County, where monthly school cafeteria taste tests highlight foods the students are growing in their school gardens.

In the bustling school cafeteria at Oak Hill Elementary School in High Point, Extension Master Gardener volunteer Ken Meeks hands out little paper cups filled with broccoli florets baked in olive oil and parmesan cheese. An older gentleman with an affable manner, the kids perk up when he nears their table. “Who wants to try broccoli?” he calls out from behind his broccoli cart. Hands shoot up quickly. The broccoli, local and organic, was sourced from a farm about 30 miles away from the school.

One by one, the kids – who are encouraged, but not forced to try the foods – sample the broccoli. Some take little nibbles, wincing almost as if in pain; others chew slowly,

“Kids are engaged, test scores are up, kids have a much greater appreciation of where food comes from. They've learned life skills – they know how to improve and amend soils, they understand seasonality.”

– Karen Neill, Guilford County Cooperative Extension Service Horticulture Agent



Radishes!

Photo: JJ Richardson/CEFS



pensively; still others gulp the pieces down practically whole and ask for seconds. All seem excited by what is taking place. The students receive stickers for trying the food, and as they leave the cafeteria they record their official “taste-test” opinion by affixing small colored dots to sections of posterboard that read “I loved it!”, “Only so-so”, etc.

“The kids really enjoy [the taste tests],” says Julie Oxendine, the school's cafeteria manager. “It starts in kindergarten – FoodCorps is here and encouraging [kids to try different foods]. By the time they're in third and fourth grade, they already have the habit, and they're not afraid to try new things.”

Beyond the significant on-the-ground impact that FoodCorps is having in schools, the program is also helping to advance the Farm-to-School movement generally across the state. The FoodCorps fellow devotes a portion of her time to supporting the growth of the Farm to School Coalition of North Carolina, a group that brings together numerous agencies and organizations in an effort to leverage the multiple Farm-to-School efforts in the state, and maximize policies and resources that enhance Farm-to-School work.

As the Oak Hill Elementary taste test winds down, outside the school a group of children is doing a garden-based activity. Led by FoodCorps service member Melissa Tingling, students are tending to raised beds of radishes, lettuces and other greens.

Shrieking with excitement, they race over to one of the beds. “Hey, I found broccoli!” one of them yells. Another, gently holding a watering can, names the plants as he waters. “That's cilantro, there's kale....” Melissa calls them over to the radish bed and announces that they can harvest small bunches to take home and eat with their families. Hunched over the beds, their little hands dig out the radishes one by one, triumphantly holding them up for inspection. Happy faces shining, not one minds the dirt under their nails.



Extension Master Gardener volunteer Ken Meeks hands out broccoli samples at Oak Hill Elementary's cafeteria taste-test.
Photo: JJ Richardson/CEFS

CEFS' RESEARCH FARM: A Regional Resource, Addressing Global Challenges

Located on 2000 acres of Eastern North Carolina soils, the North Carolina Department of Agriculture and Consumer Services' (NCDA&CS) Cherry Farm in Goldsboro is home to CEFS' research farm. One of the nation's premier research and demonstration facilities for organic and sustainable production systems, the CEFS farm houses CEFS' core research programs, or "units." The Farming Systems Research Unit, the Organic Research Unit, the Pasture-Based Beef and Dairy Units, the Small Farm Unit, and the Alternative Swine Unit all provide research opportunities for faculty, graduate students and visiting scientists, and demonstration models for farmers, extension agents and students.

The farm is a unique resource. Faculty from North Carolina State University (NC State) and North Carolina Agricultural and Technical State University (NC A&T) utilize the farm to conduct research on a wide range of production factors including soil health, land and water conservation, insect and disease dynamics, and pasture management. Farm research is supported by staff from the NCDA&CS' Research Stations Division, headed by Research Operations Manager Andy Meier. Says Meier, "The success of the CEFS research and demonstration program is directly related to the cooperative partnership of NC State, NC A&T and NCDA&CS, and also to the long-term, multi-disciplinary approach to both applied and basic research questions."



After rainfall events, gas collection units like these are used to measure greenhouse gas emissions in the FSRU.
Photo: Tomas Moreno/CEFS

The research has had a tremendous impact on farmers across the state. Debbie Hamrick, Director of Specialty Crops for the North Carolina Farm Bureau, has seen how the farm's research benefits a wide range of producers, from small- to large-scale, and conventional to certified organic. "CEFS' work gives people reasons to unite, not segregate," she says. "The research being conducted at CEFS informs the science that underpins modern agricultural production. Through looking at problems with multidisciplinary rigor at the core of crop and livestock systems, CEFS' work is useful for all agricultural producers in North Carolina and nationally."

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**- Debbie Hamrick, Director of Specialty Crops,
North Carolina Farm Bureau**

In fact, CEFS' Farming System Research Unit (FSRU) is home to one of the country's foremost long-term, comparative systems experiments. The unit's 200+ acres are split into five different systems which have been in continuous study since 1999: Best Management Practices in a Conventional Cash Cropping System; an Integrated Crop-Animal System; an Organic Cropping System; a Plantation Forestry System; and a Successional Ecosystem.

Dr. Chris Reberg-Horton, CEFS Assistant Director of Collaborative Research, helps manage the unit. "Comparative systems trials are the best method for assessing the long-term impacts of farming practices on productivity and the environment. For the last 15 years, the FSRU trials have produced data that serve as an important resource to scientists and policy makers in the U.S. and internationally," he says.



Grain sorghum ready to be harvested in the Best Management Practices in a Conventional Cash Cropping System.

Photo: Tomas Moreno/CEFS

While conceived as a long-term study, the FSRU was also designed to allow the nesting of short-term experiments, enabling scientists to study emerging issues that impact producers immediately. Responding to growing concern about climate change and its impact on agriculture, in 2013 CEFS researchers initiated a study at the FSRU entitled *Assessing the Greenhouse Gas Mitigation Potential of Organic Systems in the Southeast*. The central hypothesis of the project is that organic farming can reduce greenhouse gas emissions by reducing tillage and chemical nitrogen fertilizers, while taking advantage of organic manures and cover crops.

Greenhouse gases are produced in the soil and, depending on how that soil is managed, eventually released into the atmosphere. The United Nations Food and Agriculture Organization estimates that agriculture contributes 14% of global greenhouse gas emissions. The FSRU research compares three certified organic systems and three parallel conventional systems in order to quantify carbon dioxide and nitrous oxide emissions and identify the potential mechanisms underlying carbon and nitrogen stabilization in soil.

"Organic farming may provide one of the most economically and environmentally-friendly farming practices for reducing greenhouse gas emissions while enhancing soil carbon storage," says Dr. Shuijin Hu, a professor of Soil Ecology in the Plant Pathology Department at NC State and the project's lead researcher.

Outcomes of the project will provide essential data for developing agricultural practices that reduce nitrous oxide emissions while increasing soil carbon sequestration. CEFS faculty will also develop new curricula on greenhouse gases and agriculture for educating students and stakeholders.

Dr. Charles W. Raczowski, Soil Scientist and Adjunct Associate Professor in the School of Agriculture and Natural Sciences at NC A&T, has been conducting experiments at the FSRU since its inception. The long-term research housed at the unit is critical, says Dr. Raczowski, because of the ability to verify results over the long-term. "Many of the natural processes that occur at the field scale are not represented under small plot experiments. Recommendations have consequences for growers. We have more credibility making recommendations based on evidence gathered from large-scale experiments like we have at CEFS," he concludes.



Dairy steers grazing in the Integrated Crop-Animal System.

Photo: Tomas Moreno/CEFS

THE CEFS CHALLENGE

A \$5 Million Initiative for Sustainable Farms, Local Foods and Healthy Communities

A sustainable food system is more than just a vision – it's a challenge to us all.

CEFS has embraced the challenge. We are committed to growing vibrant farms, healthy people, sustainable ecosystems, robust local economies, and strong communities through collaborative, transformative food systems change in our state and the nation.

The CEFS Challenge invites members of the business, health, and agricultural sectors, food consumers and local communities across North Carolina and beyond to join in a comprehensive, empowering effort to make this vision a reality.

Funds raised through the CEFS Challenge provide critical support for continued visionary leadership and high impact programs advancing sustainable agriculture, community-based food systems, health and well-being, and youth leadership development. Further, the CEFS Challenge will help build a sustaining endowment to ensure that CEFS – and North Carolina – continue to provide national models for food system transformation.

TAKE THE CHALLENGE

Everyone has a stake in the health of our communities, the sustainability of our environment, and the strength of our economy.

And everyone can make a difference.

Join us in creating a sustainable future for North Carolina, our nation, and the world.

W.K. KELLOGG FOUNDATION

The W.K. Kellogg Foundation sparked the CEFS Challenge through challenge grants of \$1,500,000 to both NC State University and North Carolina A&T State University to create the W.K. Kellogg Distinguished Professorships in Sustainable Agriculture and Community-Based Food Systems. The W.K. Kellogg Foundation partnership with CEFS was established to facilitate the development of a national model for creating and sustaining a vibrant local food economy, from sustainable farms to healthy people and communities.

“We saw CEFS, and the partnership between NC State and NC A&T, as a national model for food systems change, one in which they could leverage their institutional partnerships, innovative civic engagement programs, and supply chain expertise to transform the state's food system to make it not only more sustainable, but also more equitable for vulnerable communities who often lack access to local and fresh foods.”

- Dr. Ricardo Salvador, W.K. Kellogg Foundation Program Officer, 2006 - 2012



**W.K.
KELLOGG
FOUNDATION™**

A Partner With Communities Where Children Come First



Former CEFS Apprentice Christy Ottinger prepares to wash and pack the day's broccoli harvest.

Photo: CEFS

BLUE CROSS AND BLUE SHIELD OF NORTH CAROLINA FOUNDATION

The Blue Cross and Blue Shield of North Carolina (BCBSNC) Foundation recognized in CEFS an opportunity to advance its mission of improving the health and well-being of North Carolinians.

The BCBSNC Foundation's early partnership with CEFS included support for the establishment of FoodCorps North Carolina and involvement in developing the statewide action plan for creating a local food economy. With an investment of \$2.5 million, the BCBSNC Foundation answered the W.K. Kellogg challenge to support the endowment, and also partnered with CEFS to establish a roadmap for improving community health through increased access to healthy food, facilitating programs for youth engagement and leadership development, and increasing access to local foods through innovative supply chain partnerships and infrastructure development.

“Nearly a quarter of Blue Cross and Blue Shield of North Carolina's claims go towards obesity and diet-related disease. In order to reduce health care costs over the long term, the BCBSNC Foundation recognizes that all North Carolinians need to have easy access to healthy, local food and our investment in CEFS is a critical component in building the system that can make that access happen.”

-Jennifer MacDougall, Healthy Active Communities Senior Program Officer, BCBSNC Foundation



**BlueCross BlueShield
of North Carolina**

Foundation

An independent licensee of the Blue Cross and Blue Shield Association

CEFS CHALLENGE NAMING OPPORTUNITIES

YOUTH ENGAGEMENT & LEADERSHIP DEVELOPMENT PROGRAM ENDOWMENTS

Named FoodCorps North Carolina Program	\$2,000,000
Named Young Emerging Leaders Program	\$2,000,000
FoodCorps North Carolina Support Fund	\$100,000
Young Emerging Leaders Support Fund	\$100,000

STUDENT OPPORTUNITIES & ACADEMIC PROGRAMS

Endowed CEFS Internship Program	\$1,000,000
Agroecology Program Endowment	\$1,000,000
Endowed CEFS Apprenticeship Program	\$600,000
CEFS Graduate Student Fellowships	\$500,000
Individual Apprenticeships	\$100,000
Individual Internships	\$75,000
Agroecology Farm & Service-Learning Internships	\$75,000
CEFS Special Project Endowments	\$25,000

RESEARCH & EXTENSION PROGRAM ENDOWMENTS

Farming Systems Research Unit Program	\$1,000,000
Organic Research Unit Program	\$1,000,000
Pasture-Based Beef Unit Program	\$1,000,000
Pasture-Based Dairy Unit Program	\$1,000,000
Small Farm Unit Program	\$1,000,000
Alternative Swine Unit Program	\$1,000,000
NC Choices Program	\$1,000,000

Named support funds supporting any of these programs may be established through gifts of \$100,000 or more.



FoodCorps North Carolina teaches youth about where their food comes from, as with these laying hens at Aberdeen Elementary school in Moore County. Photo: Tes Thraves/CEFS



Pigs on pasture at CEFS' Alternative Swine Production Unit. Photo: Silvana Pietrosomoli-Castagni/CEFS

DOWN ON THE FARM

CEFS Farm Endowment	\$1,000,000
Endowed Small Unit Farm Manager	\$1,000,000
Endowed NC State Agroecology Farm Manager	\$1,000,000
Endowed NC A&T Student Farm Manager	\$1,000,000

FACULTY OF DISTINCTION

Distinguished Chair in Sustainable Agriculture & Community-Based Foods Systems (Co-named with a gift from W.K. Kellogg Foundation)	\$1,000,000
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These naming opportunities represent just a few of the ways that your investment can support CEFS and its mission.

Please contact us at (919) 513-8294 or cefschallenge@ncsu.edu to learn more.



High tunnel lettuces at CEFS' Small Farm Unit.

Photo: CEFS



Former CEFS Apprentice Callie Herron (center) helps deliver a produce donation from CEFS' Small Farm Unit (SFU) to the Goldsboro soup kitchen. The SFU donated nearly 10,000 pounds of produce to community partners in 2013. Photo: Bryan Green



Volunteers are an important part of the Small Farm Unit's connection to the Goldsboro community. Here, a volunteer group helps harvest kohlrabi and other greens. Photo: CEFS



Master butcher Kari Underly and NC-based butcher Karen Fowler lead a whole animal butchery workshop for women producers and niche meat professionals at the 2013 NC Choices Women Working in the Meat Business Retreat. Photo: Briana Brough Photography

OTHER OPPORTUNITIES FOR INVESTMENT AND ENGAGEMENT

BECOME A FRIEND OF CEFS

A gift to CEFS is an investment in the future of sustainable agriculture. CEFS' farm and programmatic needs are constantly evolving, and new opportunities are always on the horizon. By making an undesignated gift to the CEFS Challenge, you will enable the Directors to immediately apply flexible funding to the area of greatest opportunity, and support every area of CEFS and its programs. All donors to the CEFS Challenge will be recognized as Friends of CEFS.

SPONSOR AN EVENT

Sponsorship opportunities are available for CEFS outreach events such as the Seasons of Sustainable Agriculture workshop series, the Farm to Fork picnic, and CEFS' annual Sustainable Agriculture Lecture. Sponsors are proudly recognized in gratitude for their role in supporting CEFS' events and programs. Please call (919) 515-9447 for details.

VOLUNTEER

Whether you prefer to get your hands dirty on the farm, or work with members of the community at outreach events, there are plenty of ways to support CEFS and its mission with your time and energy. For more information about volunteer opportunities, please visit the CEFS website at www.cefs.ncsu.edu or call (919) 513-0954.

ATTEND A WORKSHOP

CEFS' annual Seasons of Sustainable Agriculture (SOSA) Workshop Series offers workshops, webinars and training sessions on topics ranging from agricultural production techniques to livestock health, organic grains and cover crops, marketing, and community-based food systems. For more information, visit www.cefs.ncsu.edu or call (919) 513-0954.

ATTEND A LECTURE

The CEFS Sustainable Agriculture Lecture is an annual lecture series featuring dynamic and world-renowned thought leaders. Past speakers have included Carlo Petrini, founder of the international Slow Food organization; Judy Wicks, co-founder of Business Alliance for Local Living Economies (BALLE); and Will Allen, MacArthur Genius Award recipient and founder of Growing Power, Inc. Keep track of the annual lecture and other events online at www.cefs.ncsu.edu.

WAYS OF GIVING

ONLINE:

To make a gift to the CEFS Challenge, go to go.ncsu.edu/cefschallenge

BY CHECK:

Checks may be made payable to the NC Agricultural Foundation, Inc. Send to: NC Agricultural Foundation, NC State University, Box 7645, Raleigh, NC 27695. Please write 'CEFS Challenge' on the notation line.

GIFTS IN KIND:

CEFS welcomes in-kind gifts, generally defined as non-cash gifts of material or equipment. Opportunities may include (but are not limited to) gifts of farm equipment, technology, or food for events. Please call 919-515-9447 for details.

BEQUESTS AND DEFERRED GIFTS:

Deferred gifts can support CEFS in perpetuity, while providing income for your retirement or your heirs. For further information on these and other giving options, please call (919) 513-8294 or email cefschallenge@ncsu.edu.

All gifts to the CEFS Challenge are tax-deductible. Donors will receive an official receipt for each contribution. CEFS Challenge fundraising operates under the auspices of the NC Agricultural Foundation, Inc., a 501(c)(3) organization. The NC Agricultural Foundation, Inc.'s tax ID number is 56-6049304.

10 PERCENT LOCAL FOODS CHALLENGE

Through a commitment to dedicate 10 percent of food purchases to local foods available at grocery stores, farmers markets, Community Supported Agriculture (CSAs), restaurants, food service, and other channels, North Carolina consumers can inject \$3.5 billion per year into the local economy. This level of investment will build and expand local food systems, fuel rural economies, strengthen family farms, and support public health. Learn more and sign up for the NC 10% Campaign at www.nc10percent.com



Participants pruning blackberries at a Seasons of Sustainable Agriculture Blackberry Production workshop organized by CEFS and the Wayne County Cooperative Extension Service. Photo: Lisa Forehand/CEFS



Enjoying a beautiful day at CEFS' Farm to Fork Picnic, named "the country's best all-you-can-eat-feast" by *Bon Appetit* magazine. Photo: CEFS



Maya Wiley, Founder and President of the Center for Social Inclusion (left), with former US Congresswoman and current CEFS Board Member Eva Clayton (center) and Dr. John O'Sullivan, CEFS Director from NC A&T State University (right). Ms. Wiley delivered CEFS' 2013 Sustainable Agriculture Lecture. Photo: Raymond Goodman/r3photo

THE CEFS CHALLENGE:

Sustainable Farms, Local Foods, Healthy Communities

was produced by JJ Richardson at the Center for Environmental Farming Systems.

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