ORGANIC OPPORTUNITIES

Investing in the Expansion of Organic Food and Agriculture in Northeastern North Carolina

SEED CAPITAL: FINANCING ORGANIC TO BUILD RURAL WEALTH, COMMUNITY HEALTH

SMALL IS BEAUTIFUL: NC
ORGANIC FARMS PUNCH ABOVE
THEIR WEIGHT

HATCHING GOOD EGGS: FILLING GAPS IN THE \$55M POULTRY VALUE CHAIN

SWEETENING THE DEAL: ADDING VALUE TO +\$20M IN SWEET POTATO SALES







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Uli Bennewitz, Weeping Radish Brewery

Gerry Cohn, Organic Valley

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ACKNOWLEDGMENTS

The Organic Agriculture Revitalization Strategy (OARS) owes a deep debt of gratitude to numerous organizations and individuals who made the first pilot project in northeastern North Carolina possible. The initial idea for taking such a regional approach to organic food and agriculture, rooted in social finance and economic development, was conceived by the late Tony Kleese of Earthwise Organics, following conversations with Josh Humphreys of Croatan Institute at the Slow Money Southeast Regional Gathering on Money & Meaning, organized by Slow Money NC and Abundance NC in September 2015. Thanks to Slow Money NC co-founder Carol Peppe Hewitt for organizing the gathering that ultimately catalyzed this work. Out of those early conversations, Croatan Institute and Earthwise formalized the initial idea into the OARS concept and proposed a place-based regional pilot project in northeastern NC, which Organic Valley's Farmers Advocating for Organics (FAFO) program generously supported with grant-based research seed funding in 2016. Organic Valley's Gerry Cohn joined those early conversations and helped constitute an Advisory Council, whose members are listed above. Special thanks are due to all the members of the Advisory Council who made themselves available for numerous conference calls, individual meetings and interviews, and OARS convenings, where most played roles as speakers or facilitators.

Over the course of the pilot project, a growing group of sponsoring partners, also listed above, formally agreed to provide additional financial and in-kind support to OARS. Special thanks to the following individuals from the sponsoring partner organizations for their input and insight: Paula Alexander and Matt Kopac of the Burt's Bees Greater Good Foundation; Ruffin Slater and Carolyn Twesten of Weaver Street Market: Alexandra Sirota and Brian Kennedy of the NC Justice Center's Budget and Tax Center; Dr. Rebecca Dunning and Laura Lauffer of the NC Growing Together program of the Center for Environmental Farming Systems of NC State and NC A&T State Universities; Chef Jeff Barney and Madeline Baker of the Saxapahaw General Store; Eric Henry of TS Designs; Rick Larson, T.F. Congleton, and Julius Tillery of the Natural Capital Investment Fund; Dr. Carla Norwood and Dr. Gabriel Cumming of Working Landscapes; Henry and Ardis Crews of the Green Rural Redevelopment Organization; Carol Robinson, Marion Williams, Ardis Crews, and Rosetta Thorpe of the Southern Organic Female Farmers Association (SOFFA); Dave Miller, John Steven Bianucci, Kevin Egolf, Alex Mackay, and Claire Mesesan of Iroquois Valley Farms; Rev. Richard Joyner of the Conetoe Family Life Center; Dr. David LeZaks of Delta Institute; and Sam Suchoff of Lady Edison.

We would also like to thank Nash Community College, the New Bern Farmers Market, American Underground, and Momentum Learning for providing OARS with event space for several in-person meetings. The Resourceful Communities program of the Conservation Fund, the Healthy Foods Coalition of the Partnerships to Improve Community Health (PICH) of the Northeastern North Carolina Partnership for Public Health, the Just Foods Collaborative in Nash and Edgecombe Counties, the new Tarboro/Edgecombe Producers and Market working group jointly organized by NC Cooperative Extension's Edgecombe County Center and the Twin Counties Catalyst for Healthy Eating and Active Living of the Foundation for Health Leadership & Innovation, and the Carolina Farm Stewardship Association (CFSA) all generously made space on their busy conference and meeting agendas for OARS team members to engage with participants in their networks. Within these five groups, we would like to give special thanks to Mikki Sager, Kathleen Marks, and Monica McCann of the Conservation Fund; Wes Gray, formerly with the Albemarle Regional Health System and Healthy Foods Coordinator for PICH; Calvin Allen, Brandy Bynum Dawson, and Jessica Burroughs from Rural Forward NC, for the Just Foods Collaborative; Yvonne Murphy of NC Cooperative Extension and Derrick Haskins of the Foundation for Health Leadership & Innovation for the Tarboro/Edgecombe Market group; and Roland McReynolds, Rochelle Sparko, and Thomas Moore of CFSA. We look forward to deepening our engagement with each of these important communities of practice as we turn to OARS implementation opportunities in the region.

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Michelle Brown of the City of Wilson; April Williams of the Tarboro Market; and Franca and Steve Gilbert of Alimentaire Wholesome Bread Co.

Croatan Institute has generously agreed to host and coordinate OARS and publish this prospectus. Special thanks to Josh Humphreys, Kristin Lang, Christi Electris, Matt Aitken, and Amy Campbell Bogie, as well as former Croatan Institute affiliates LaShauna Austria, Andreea Rodinciuc, and the late Fern Jones, for their dedicated research, analysis, coordination, and leadership.

Finally, numerous farmers took time out of their busy schedules to speak with OARS team members on the phone and in the field and to attend OARS convenings. Special thanks to Ben Haines of Looking Back Farm, Fred Inglis of Somerset Farm in Edenton, Orpha Gene Watson and Peyton McDaniel of Hickory Meadows Organics in Whitakers, T.F. Congleton of Pitt Co., Butch Byrum of Cottonman.com in Edenton, Ray Hillman of Pikeville, Tim Shelton of Stantonsburg, William Wollett, Jr., of Stone House Farms in Red Oak, Jeff Tyson of Tyson Family Organic Farms, Inc. in Nashville, Ashley Williams in Belvidere, the Crews and Brodie Farms in Henderson, Rev. Joyner of the Conetoe Family Life Center, Daryl Walker of Ayrshire Croft in Carteret Co., Tom Butler of Butler Farms in Lillington, Suzanne Nelson of Reverence Farms, Julius Tillery of Bynum Farm, and Kent Williamson of George Hill Farm and the Piedmont Progressive Farmers Group.

DEDICATION

On the OARS team, Tony Kleese led the pilot project's farmer outreach until his fight with cancer made it difficult for him to continue to stay as actively engaged in the day-to-day details of the project. Nevertheless, Tony actively participated in our OARS community convening in Rocky Mount in August 2017 and in Advisory Council calls last fall, and he continued contributing data and resources through



Tony Kleese standing in his seed variety trial field in the summer of 2017 in NC. Source: The People's Seed.

the very end of our research last year. He passed away on March 17, 2018, just as this publication was going to press. As he was in so many other endeavors, from his contributions to the first national organic standards and his leadership of the Organic Certifiers' Council to the organization and leadership of CFSA to the founding of The People's Seed, Tony Kleese was the pioneering visionary behind OARS as well. This report on the opportunities that organic food and agriculture present for resilient regional economic development in a place he helped transform is dedicated to him.





ORGANIC AGRICULTURE REVITALIZATION STRATEGY

ABOUT OARS

The Organic Agriculture Revitalization Strategy is an initiative that seeks to take advantage of growing consumer and investor interest in organic food and agriculture – now nearly a \$50 billion mainstream market – and use it as a strategy for revitalizing rural communities and supporting regional economic development. Developed by Croatan Institute and Earthwise Organics with initial support from Organic Valley's Farmers Advocating for Organics program and a growing group of partners, OARS aims to identify business and investment opportunities in regional value chains and to mobilize capital to help build community health and wealth. For more information, please visit



ABOUT CROATAN INSTITUTE

Croatan Institute is an independent, nonprofit research institute whose mission is to harness the power of investment for social good and ecological resilience by working at the critical nexus where finance, sustainability, and economic development intersect. For more information about the Institute's people, programs, and publications, visit



ORGAN®C OPPORTUNITIES

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BACKGROUND

Since the development of the USDA Organic certification program at the beginning of the 21st century, organic food and agriculture has experienced double-digit annualized growth, making it one of the fastest growing segments in agriculture today. Data from the Organic Trade Association (OTA) track organic sales growing more than 10-fold over the last two decades from less than \$4 billion in 1997 to nearly \$50 billion in 2017. In a 2016 Nielsen survey, 82 percent of US households reported that they had purchased some organic products, and recent National Consumer Surveys from Packaged Facts show that a growing number of consumers, driven by millennials, are buying organic and fresh, local products with even greater conviction. Currently, organic food sales now make up approximately five percent of all total food sales in the US, according to the OTA; however, less than one percent of total agricultural land in the US is certified to grow organic. That supply-demand imbalance in the US market is compensated by foreign imports, which have recently been shown to lack the same degree of

integrity as domestic organic products. For enterprising farmers, farmland investors, and entrepreneurs focused on building businesses across organic food and agricultural value chains, the domestic organic market therefore presents considerable opportunities to tap into a market rapidly expanding from niche to mainstream.

According to the Pew Research Center, shoppers concerned with health, animal welfare, food safety, and sustainability often buy certified organic products because they perceive them to be healthier and safer than their non-organic counterparts. Because organic farming typically eliminates the use of synthetic chemical pesticides, herbicides, fungicides, and fertilizers, organic products have been shown to have substantially lower levels of synthetic chemical residues and also higher levels of antioxidants, although debates about the difference in nutritional content between organic and conventional foods remains hotly debated. The lower levels of synthetic chemicals used on farms generally provide strong environmental benefits for rural landscapes and lower the exposure of farmworkers to toxic chemicals as well.





ORGANIC HOTSPOTS ARE ECONOMIC BRIGHT SPOTS

In addition to being more environmentally sustainable, certified organic agriculture has also demonstrated socio-economic benefits to rural areas where organic farms and value-chain businesses are concentrated. Generally, the added value that organic certification provides generates premium pricing for organic products over non-organic counterparts, and this can translate into stronger revenues across organic value chains. Recent research by economists at Penn State has highlighted how dense geographic clusters of organic agriculture - what are termed "organic hotspots" – are correlated with better socio-economic outcomes. In organic hotspots, poverty rates tend to be 1.3 percent lower, median household incomes run \$2,000 higher, and unemployment rates were found to be lower than average - benefits that rural areas dominated by non-organic agriculture operations fail to deliver. Currently, however, the geographic range of organic hotspots is fairly limited to the Northeast and New England, the upper Midwest, and the West Coast; there is no place in the South that is benefiting from these potentially positive effects of clustered organic activity because local Southern food and agriculture systems lack adequate concentration of organic operations.



RE-ENVISIONING ORGANIC AGRICULTURE AS A RURAL REVITALIZATION STRATEGY

The Organic Agriculture Revitalization Strategy (OARS) builds upon the basic insight of this emerging research – that certified organic agriculture can provide not only environmental benefits but also socio-economic benefits, revitalizing rural landscapes and communities and building community health and wealth together. In order to foster the necessary density of organic agriculture that will generate these kinds of socio-economic dividends, stronger value chains rooted in more resilient regional food and agricultural systems are going to be needed to support more densely clustered organic activity. Resilient value chains also need investment, and a growing number of investors are allocating capital to sustainable food and agriculture across asset classes and across geographies.

OARS therefore re-envisions organic food and agriculture as a regional economic development opportunity, and advances a new cooperative framework of value-chain research, analysis, convening, and consultation that engages with farmers, food and ag.





entrepreneurs, impact investors, community development financial institutions, economic development officials, researchers, public

health practitioners, and technical assistance providers. Initial OARS-related research, collaboratively published by a consortium that included Croatan Institute, Trillium Asset Management, Iroquois Valley Farms, the Maine Organic Farmers and Gardeners Association, Root Capital, and RSF Social Finance, has explored innovative approaches to impact investing in sustainable food and agriculture that can finance more resilient value chains. This initial OARS research is now being leveraged into a major, new multi-year partnership on new mechanisms for financing regenerative agriculture, being led by Delta Institute with financial support from a Conservation Innovation Grant of USDA's Natural Resources



Images courtesy of Working Landscapes.

Conservation Service and active involvement of a group of two dozen partners, including Croatan Institute, Encourage Capital, LIFT Economy, Farmland LP, Pipeline Foods, and Rodale Institute, among many others. The initiative is conducting research, building financial tools, and convening a new Regenerative Agriculture Investor Network (RAIN).





Carla Norwood and Gabriel Cumming of Working Landscapes in front of a building they renovated in Warrenton, NC. Source: Community Voice.

"At Working Landscapes, we are collaborating with partners across northeastern North Carolina to rebuild the rural economy through food system development. At our food hub, which processes fresh-cut produce for food service applications, we are encountering increased customer interest in organic products. We also see more farmers going organic to meet this demand. What is needed now are critical infrastructure investments in our region's organic value chains."

- Gabriel Cumming, Working Landscapes

NORTH CAROLINA A RISING STAR IN ORGANIC AGRICULTURE

In order to develop a more place-based, economic development approach to financing organic food and agricultural value chains, OARS has undertaken an 18month pilot project in northeastern North Carolina, a Southern geography with great potential to benefit from the expansion of its emerging organic food and agriculture value chain. The initial OARS partners selected this geography for a variety of reasons. Eastern North Carolina is generally known as a major locus for large-scale conventional agriculture, dominated by concentrated, feedlot hog and poultry operations and tobacco farms. Farming is a major \$10.6 billion industry for the state. North Carolina leads the nation in all poultry and egg, tobacco, and sweet potato sales, and it consistently ranks highly in hogs and pigs, strawberries, pumpkins, cucumbers, peppers, blueberries, and peanuts. Soybeans, corn, cotton, cattle, and dairy products each also generate more than \$100 million in annual farm sales in the state.

Although no place in NC can be considered an organic hotspot, the state is nevertheless a long-standing leader in sustainable agriculture in the South,

widely recognized for its vibrant ecosystem of farm stewards and supporting organizations, including its land-grant research universities, numerous pioneering nonprofits, and entrepreneurial food hubs and aggregators. For example, the Carolina Farm Stewardship Association was founded in 1979, as a farmer-led membership organization to serve both North and South Carolina. In 2004 CFSA incubated Eastern Carolina Organics (ECO), a farmer-owned organic aggregator and wholesale distributor that has helped expand the reach of NC organic farmers into new markets, and since 2010 CFSA has organized an important Organic Commodities and Livestock Conference, targeted to the needs of commercial organic growers. North Carolina is also home to the Rural Advancement Foundation International (RAFI), which was formally incorporated in 1990 to support small and mid-size family farmers. RAFI traces its roots back to the National Sharecroppers' Fund, founded in the 1930s by a group of racially integrated tenant farmers.



Alongside these two pioneering nonprofits, North Carolina's two land-grant universities, NC State and NC A&T, have come together in an unprecedented collaboration between 1862 and 1890 land-grant universities to develop the Center for Environmental Farming Systems (CEFS). In collaboration with the NC Department of Agriculture and Consumer Services, CEFS has become one of the nation's leading centers for research, extension, and education in sustainable agriculture and community-based food systems. Its 2,200-acre research farm in Goldsboro, NC, includes more than 100 acres of dedicated, certified organic farmland. The Center has spawned numerous initiatives including an Organic Research Unit and an Organic Grains Program, both directed by Dr. Chris Reberg-Horton, Associate Professor of Crop Science at NC State. The Organic Research Unit has undertaken a wide array of organic production trials on crops such as cotton, stevia, and tomatoes, and grains such as winter pea, winter canola, corn, wheat, sorghum, and soybeans. CEFS also hosts several food system initiatives, including NC Growing Together, a five-year initiative focused on mainstreaming local food supply chains, led by NC State's Dr. Rebecca Dunning, Community Food Strategies to support community-based local food councils, and NC Choices, an initiative to promote local, niche, and pasture-based meats.

Numerous collaborative initiatives to support local, organic food and farming have percolated around the state as well. NC has more local food councils than any other state than California. Abundance NC, a nonprofit focused on local resilience, has hosted one of the nation's most vibrant local chapters of the national Slow Money movement as well as a new initiative called Local Organic Y'all that is engaging grocers in the state to source more local, organic food. Even more recently, cooperatives such as the Southern Organic Female Farmers Association (SOFFA) have emerged to help small-scale female farmers of color and community gardens obtain organic certification and to make organic food accessible to low-income communities with high health disparities.

"We're not doing the same old thing. We're talking about working together to address a growing need. We grow what sells, and we grow organically."

Ardis Crews, SOFFA



Ardis Crews of SOFFA (fifth from left) is joined by supporters from the community. Source: The Conservation Fund

With its NC roots, OARS is merely one of the most recent manifestations of a much longer-standing tradition of field-building organic research, collaboration, and leadership found in the state.

This supportive ecosystem for sustainable agriculture has made NC not just a regional leader in the South, but increasingly a place to watch for organic farming on the national scene as well. In 2016 for the first time, NC joined the Top 10 states with the highest organic sales, with \$145 million. According to the USDA, the number of certified organic farms in NC has grown twice as fast as the national trend over the last two years, increasing 22 percent from 203 to 247, while the overall number of farms and farm acreage, both state- and nationwide,



have shown steady, secular declines. Although rapidly increasing in number, NC organic farms remain smaller on average than the national average, but they are also considerably more productive. Average organic sales per farm in NC were much higher than the national average, and NC organic farms in aggregate generated \$4,600 in sales per acre, making them more than three

times more productive than the national average. Indeed, in terms of sales per acre, OARS analysis reveals that NC organic farms have become more productive than farms in the Top 10 states with the most certified organic acreage, including leading states such as California, New York, Wisconsin, Oregon, Colorado, Texas, and Vermont. As the nearby table further highlights, NC organic farms are actually more productive on this same metric than every other Top 10 state with leading organic sales, except for Pennsylvania and Washington. When it comes to organic farming, economies of scale clearly do not always provide conditions for success. Nationwide as conventional farming declines or stagnates, organic agriculture finds itself rapidly growing in terms of farms, acreage, and sales, and by every one of those metrics, NC organic agriculture is outpacing national averages, often by wide margins.

Table 1 Top ten states for certified organic sales.

State	Certified Organic Sales (\$ millions)
California	2,889
Pennsylvania	660
Washington	636
Oregon	351
Texas	297
Wisconsin	255
New York	216
Michigan	201
Colorado	181
North Carolina	145
US TOTAL	7,553

Source: 2016 Certified Organic Survey, USDA.

Table 2 North Carolina organic farms out perform many states with higher acreage and sales.

,	Certified Organic Acres (thousands)	Certified Organic Sales (\$ millions)	\$/acre
Washington	79	636	8,051
Pennsylvania	93	660	7,097
North Carolina	32	145	4,531
California	1,070	2,889	2,700
Michigan	76	201	2,645
Texas	147	297	2,020
Oregon	195	351	1,800
Wisconsin	219	255	1,164
Colorado	176	181	1,028
Vermont	134	127	948
New York	264	216	818
Idaho	179	98	547
Montana	266	53	199
US TOTAL	5,019	7,553	1,505

Source: 2016 USDA Certified Organic Survey; Croatan Institute analysis.



Table 3 Top organic crops produced in North Carolina, 2016

		Farms	Acres	Sales (dollars)	National Rank
All vegetable		81	4,335	31,666,249	
	SWEET POTATOES	47	3,235	20,734,490	2
	TOMATOES	25	123	5,227,426	3
	SQUASH	29	187	1,806,335	7
All field crops		162	15,843	43,979,140	
	TOBACCO	119	6,391	38,975,521	1
	CORN FOR GRAIN	12	119	1,654,740	20
	SOYBEANS	33	2,388	1,315,145	9
All berries an	d other fruits	29	214	1,365,083	
	BLUEBERRIES	18	197	965,336	6
	STRAWBERRIES	10	12	358,487	7
	GRAPES	5	30	176,488	5



Source: 2016 Certified Organic Survey, USDA, and Croatan Institute analysis. Rank based on sales.

Table 4 Organic Chicken and Eggs Production in North Carolina, 2016.

		Farms	Sales (dollars)	National Rank
Laying Hens and Eggs				
	CHICKEN EGGS	18	55,252,105	4
	CHICKENS - LAYERS	18	163,742	5

Source: 2016 Certified Organic Survey, USDA, and Croatan Institute analysis. Rank based on sales.



The state of North Carolina, with the OARS pilot region of Northeastern North Carolina highlighted



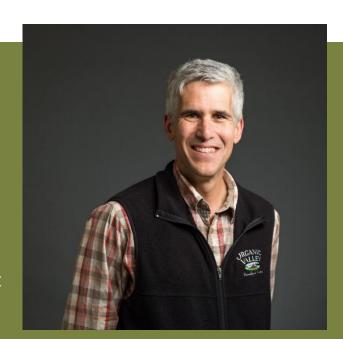
Organic farming in NC is diversified, but the bulk of organic sales in the state derive from products where the state leads in conventional production as well: specifically, organic eggs, tobacco, and sweet potatoes. Approximately \$115 million of the state's \$145 million in organic sales come from these three commodities alone. Among other leading organic products with more than \$1 million in sales are vegetables such as tomatoes and squash and field crops such as soybeans and corn. Although the value of statewide sales of organic watermelon is less than \$180,000, our analysis of USDA data shows that NC is first in the nation in organic sales of the fruit. Blueberries, strawberries, and grapes are other fruits where the state ranks highly in the national top 10 for organic sales.





"Organic Valley is excited to support OARS to demonstrate the opportunities that organic agriculture can provide for family farms and rural communities. A cooperative approach and the organic marketplace create great potential for economic development in Eastern North Carolina."

- Gerry Cohn, Organic Valley





OARS PLACE-BASED REGIONAL PILOT PROJECT IN NORTHEASTERN NORTH CAROLINA

Although USDA organic sales data are aggregated at the state level, the pilot project for OARS has focused on a 28-county region in northeastern North Carolina. This predominantly rural region is bordered on the west by the counties along the fall line that separates the region's flat coastal plain from the foothills of the central NC Piedmont, a topographic feature that roughly parallels Interstate 95, which ultimately runs the length of the eastern seaboard. This places the region equidistant between Miami and Maine, both of which are well within a day's drive.

Source: Josh Humphreys/Croatan Institute

The region's highways and byways are indeed a major part of its appeal. The state's long-standing investments in highway transportation infrastructure make it easy to navigate to and through the region. Four-lane interstates and US highways traverse the region, and increasing numbers of the state's US highways are now designated as future interstates. On the south, the pilot region is bordered by the counties that are connected by US-70, extending from the Port of Morehead City on the coast west to the state capital of Raleigh – a stretch now designated as future I-42. Future I-87 bisects the region and connects Raleigh to the Port of Norfolk, Va. With 70 mile-per-hour speed limits along many of these routes, travelers can readily access metro markets in the





Research Triangle region of Raleigh-Durham-Chapel Hill in well under three hours from all but the most remote points along the coast. Charlotte and Washington, DC, are both within 250 miles of the region's epicenter near the city of Greenville, NC, the region's largest city with a metro population of approximately 172,000 residents and home to East Carolina University, now the second largest in the University of North Carolina System. New York and Atlanta are within 500 miles of the region.

The region's farmland is dominated by soft, sandy loam soils, with a cluster of blacklands high in rich organic matter extending across the far eastern counties closest to the coast, where farming suddenly gives way to the coastal island economy of the state's acclaimed Outer Banks. Three major river basins - the Neuse, the Tar-Pamlico, and the Roanoke - cut southeast across the region, and when it comes to water rights, the "run of the river" also rules the land. Like many eastern states, water rights are closely and directly linked to property rights, in a "regulated riparian" system that gives agricultural users far more leeway than their counterparts farming in the American West. Although droughts are also far less frequent than in the West, periodic drought concerns have led to the creation of a Central Coastal Plain Capacity Use Area along the southern edge of this OARS pilot region. The system requires permitting and reporting by groundwater users withdrawing more than 100,000 gallons per day from a Cretaceous Aquifer zone; few organic farms in the

METRO AREAS IN NORTHEASTERN NC MSA Population Greenville 177,000 Rocky Mount 147,000 New Bern 126,000 Goldsboro 124,000 Source: US Census Bureau

region approach these thresholds. Although there are variations of climate across the region, annual average rainfall generally ranges from 46-53 inches, with snowfall averaging only 2-4 inches each year. USDA Hardiness Zones 7b and 8a cover most of the region, giving it a relatively long growing season ranging from 210 to 240 days per year, with the last frost in late March or early April and the first frost in early-to-mid November. The climate is also generally mild year-round, with an average annual temperature recorded in 2016 of 63 degrees and average monthly temperatures ranging from 41 degrees in January to 82 in July.





CLIMATE AND SOILS IN NORTHEASTERN NC

Average Annual Rainfall: 46-53" Average Annual Snowfall: 2-4" USDA Hardiness Zones: 7b, 8a

Growing Season: 210-240 days
Soil Types: Sandy Loam and Blacklands

The socio-economic character of the region is one of the final reasons why northeastern NC was selected for this OARS pilot project. Overall, the 28-county geographic region includes the state's broadest cluster of economically distressed "Tier 1" counties - a designation by the NC Department of Commerce that indicates a county falls in the bottom 40 percent of various economic distress measures such as median household income, unemployment, property tax base, and population growth. The designations are updated annually and change from year to year; currently, the OARS pilot region includes 17 of the state's 40 Tier 1 counties, including the two most distressed, Edgecombe and Halifax, and half of the top 10 most distressed. Halifax and Bertie Counties had the state's lowest median household incomes, the only two with less than \$32,000. Only two counties in the region, Johnston and Carteret, are considered among the 20 least distressed. Demographic dynamics overlay economic distress, as many of the most distressed counties tend to have African-American majority populations, while the least distressed are much more predominantly White. To take

Top 10 Most Economically Distressed Counties in NC

- 1. Edgecombe
- 2. Halifax
- 3. Robeson
- 4. Bertie
- 5. Scotland
- 6. Richmond
- 7. Vance
- 8. Washington
- 9. Hertford
- 10. Columbus

the most extreme cases, for example, highly distressed counties such as Edgecombe, Halifax, and Bertie have African-American populations ranging from 54 to 62 percent, whereas the least distressed counties of Johnston and Carteret have White populations ranging from 80-90 percent. The region's concentration of inequality and economic distress make the rural development potential of expanding organic food and agriculture all the more pressing in a state that is beginning to emerge as a national organic leader. In order to realize the opportunities of rural revitalization and build community health and wealth, the socioeconomic dividends of organic agricultural activity need to be widely shared.



"With a Food Policy Council, everyone is sitting at the same table. That makes them hugely important. [...] I can't think of another mechanism that lends itself so well to connecting people."

 Nancy Creamer, Center for Environmental Farming Systems (CEFS)



OARS PILOT PROJECT ACTIVITIES

Since late 2016, the OARS pilot project in northeastern NC has involved deep research and analysis of existing USDA data on certified organic operations in the region, extensive field research and consultation with value chain stakeholders, a survey of organic farmers active in and around the region, and the mapping of the regional organic value chain in order to understand gaps and opportunities for investing in its expansion.

OARS outreach has taken numerous forms. Initially, we constituted an Advisory Council of key stakeholders with a strong interest in the pilot region and extensive expertise across the value chain; it has expanded over the course of the project to include organic farmers and farming cooperatives, technical assistance providers, impact investors working in real assets and private debt, conservation and community development groups, researchers from CEFS, economic development experts from the region, and other value-chain intermediaries involved in added-value food processing and aggregation. OARS also developed a structure for interested parties to join the pilot project in more formalized ways as partners; between Advisory Council members and sponsoring partners, approximately two dozen organizations have now formally joined the OARS pilot

As the team began undertaking field work and consultations, OARS team members started participating in numerous networks and communities of practice relevant to the pilot project's work, attending meetings across the region, and making site visits to farms, farmers markets, food hubs, processing and handling facilities, cooperative extension offices, restaurants, bakeries, and groceries, and other value-chain enterprises. These networks included the Resourceful



OARS community convening in 2017. Source: Croatan Institute.

Communities program of the Conservation Fund, the Just Foods Collaborative of Nash and Edgecombe Counties, the Healthy Foods Coalition of the Partnerships to Improve Community Health active in the region, CFSA's Organic Commodities and Livestock Conference in Mt. Olive, and a new initiative focused on local foods in Edgecombe County. We also organized two in-person events in the region. A community convening at Nash Community College in Rocky Mount, NC, brought approximately 35 stakeholders together in late summer 2017 to discuss the region's assets, gaps,

as of this writing.



obstacles, and underutilized resources; the participants broke into small groups facilitated by members of the OARS Advisory Council. In late fall 2017, a regional summit at the New Bern Farmers Market was organized to present various value-chain perspectives on the pilot project's preliminary research.

In spring-summer 2017, Earthwise Organics led structured surveying of 10 farmers in the region on their organic operations, their views on issues such as labor, organic farm services, the market, and financing. This structured interviewing was complemented by additional outreach, site visits, meetings, and interviews with a half dozen additional farmers and market gardeners by Croatan Institute. This

quantitative and qualitative research and outreach provided the basis for a series of datasets used in mapping the regional value chain.



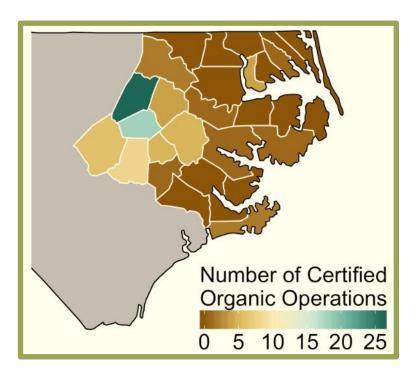
GRRO table at the New Bern Farmers Market. Source: Ron Townley.

MAPPING VALUE CHAINS, VISUALIZING

OPPORTUNITIES

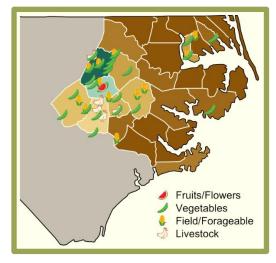
Based on USDA's Integrity database, we identified 92 organic operations in the pilot region as of late 2017. Of these, 59 were producers, 37 were handlers, and four combined operations of production and handling. As the map highlights, the largest concentration of operations in the region are clustered in the west around Nash and Wilson Counties. Nearly 40 percent of the 28 counties in the pilot region have no certified organic operations, including several highly distressed Tier 1 counties such as Bertie, Hertford, Washington, and Tyrrell.

Among the 59 producers, we identified 39 vegetable growers focused primarily on sweet potatoes, but also squash, cucumber, leafy vegetables such as lettuce and kale, and various combinations. Thirty-eight producers grew field crops, principally tobacco, soybeans, cotton, corn, wheat, and hay. Six grew fruit or flowers, primarily watermelon, and five were involved in raising pullets and organic eggs. As the map highlights, the greatest



concentration of organic production is in the western counties of the region, Nash, Wilson, Johnston, Wayne, Greene, and Pitt, although we also see a cluster in Chowan County in the far northeast.

On the organic handling side, the 37 certified operations include 18 certified aggregation/distribution operations that might involve washing, packing, aggregating or transporting, 17 companies involved in downstream processing or added-value food manufacturing, and three mills, focused primarily on soybean crushing and processing for livestock feed.



Much of that feed is flowing into the poultry value chain, which is the source of \$55 million in statewide organic sales – the highest of any organic product grown in NC. A relatively small number of five producers, clustered around Wayne, Nash, and Greene Counties, play a critical role here, primarily in raising laying hens and organic eggs, rather than broilers for meat. Six handlers are involved in upstream and downstream activities, including aggregation,

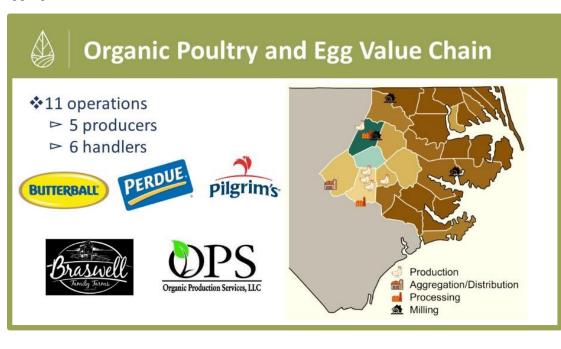
processing, and milling feed. Braswell Family Farms, Perdue, Pilgrim's, and Butterball are among the leading concerns here.

The region's three certified soy mills – affiliated with Braswell Farms' vertically integrated poultry operations, Perdue AgriBusiness, and Apex LLC's Organic Production Services – provide relatively dense regional infrastructure for the value chain, and we learned on a site visit to one of the newest mills that production capacity



Soy mill in Weldon, NC. Source: Croatan Institute

remains at only around 55 percent. Although there are numerous certified organic farmers growing soybeans in NC, the vast majority of the organic soy processed in the region's mills are actually imported, frequently from Argentina arriving through the Port of Norfolk. With controversies over the integrity of imported organic products, particularly in the global soybean supply chain, many purchasers of the soy - both the millers and the poultry farm companies - repeatedly expressed a strong interest, indeed a preference, for more domestic soy, but they also complained that there remains a wide supply-demand mismatch that only imports currently seem able to fill - a phenomenon that besets the wider global trade in organic soy. Clearly, ramping up organic soy production presents a major opportunity for the region, but the low price of imports was a repeated concern voiced by the farmers interviewed.







Although the organic egg value chain is relatively strong in the region - and poised for additional growth and expansion - there is very little production of chickens for organic meat. Numerous buyers we interviewed expressed a strong interest in local, organic chicken - a staple year-round item - but we found that most certified organic chicken is generally sourced from Pennsylvania farms and processors. Although the region's farmers clearly have poultry-raising expertise, a critical gap is in the value chain's infrastructure – with the lack of niche processing facilities devoted to meat hens anywhere in the state, except for a small handful of mobile processing units, none of which appear to be certified organic. Among livestock processing, poultry is comparatively simpler to establish than other forms of slaughter because processing can be done on one's own farm, but for growers without the resources and equipment to process on farm, they need to use a USDA certified facility. In order to create a viable USDA

certified facility that can process organic poultry, a critical mass of product would be needed to justify the investment – quite literally a chicken-or-egg issue. According to the Organic Trade Association, however, poultry is one of the largest growing segments of the rapidly growing organic market. For entrepreneurial farmers in the region that might be interested in meeting this rising demand, taking a value-chain approach with multiple partners would be helpful, and groups such as the NC Choices program of CEFS and the Niche Meat Processor Assistance Network have resources to help fill these critical infrastructure gaps.

Another robust organic value chain in the region is organized around sweet potatoes.

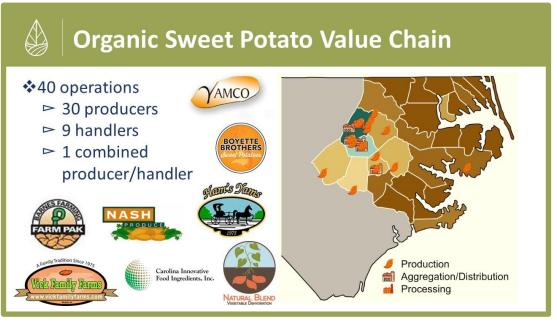
Forty operations from northeastern NC are contributing to what is now a \$20 million annual industry. They include 31 different producers, creating what several farmers described to us as an increasingly competitive environment that led some to worry that an oversupply of sweet potatoes could begin to put pressure on price – a common refrain in general among the region's organic growers we interviewed. Sweet potato growers are

highly clustered in Nash, Edgecombe,



Wilson, and Greene Counties, so understandably that corner of the region appears crowded. Nationally, NC has long been the top grower of conventional sweet potatoes since the 1970s, and growers take great pride in that history. However, the state's organic sweet potato growers aren't actually in the pole position; they lag

behind California in terms of organic sales. Given the remarkable resurgence of interest in sweet potatoes globally – as a recognized health food trend (sweet potato "toast" is becoming an actual thing) – the more rapid investment that California growers have made to organic production is worth serious consideration. Most of the ten handlers in the value





Source: Tony Kleese/Earthwise Organics

chain are primarily packing, washing, aggregating and distributing whole sweet potatoes, but Carolina Innovative Food Ingredients, Inc. is adding considerable value to the supply chain by developing certified organic sweeteners from sweet potatoes. As farmers worry about oversupplying the market, entrepreneurial food businesses should see real opportunities in adding value creatively beyond the farm gate and the packing plant.

Mapping data-rich, high performing value chains helps us see expansion opportunities by strengthening weak links in them. Stimulating domestic soybean production or introducing poultry processing are two good examples. Another is related to inputs, which farmers repeatedly described in interviews as something they repeatedly have difficulty sourcing locally or regionally. One of the most glaring gaps in this respect is related to organic seed.

Having regionally adapted, Southern certified organic grain seed readily available on a commercial basis is a clear opportunity for growth, particularly in areas with supply-demand imbalances such as in the market for soybeans. Currently, most Southern-specific organic seed is for smaller-scale vegetable growers and gardeners, rather than commercial commodity farmers. Through the Organic Grains program, agronomists at

NC State have been working on regionally adapted varieties of soybean hybrids and numerous cover crops. Although grains could readily be grown for seed rather than feed, other steps would need to be taken to move organic seed development out of R&D and into the market. Specifically, NC Foundation Seed Producers and the NC Crop Improvement Association would need to place greater priority on organic seeds. Foundation Seed in particular would need to become a certified organic operation with the infrastructure needed to ensure that the organic seed it might help develop at a more commercially viable scale is not crosscontaminated with the conventional seed it typically develops. Seed breeders and an entrepreneurial seed business would also be needed, with a strong marketing, sales, and service arm, so that farmers can see results in the field. A cooperative, or collaborative, structure for such a seed business could incentivize farmers to have an even greater stake in the upside potential of such a business. From both an agronomic and a business perspective, the commercialization of regionally adapted organic seeds would seem to be an intriguing upstream value-chain opportunity in part because under organic standards, growers need not use a certified organic seed to meet the requirements of organic certification as long as the seed is not genetically modified and it's grown with organic practices. However, as soon as a regionally adapted organic seed becomes available on the market, then organic growers must purchase the organic version - in essence creating a temporary monopoly for an enterprising seed company willing to invest in those first regionally specific organic varieties. Most non-GMO seed is produced in the Midwest in environments very different from what an organic grower will experience in the South, with humidity, weed, and pest pressures, so continuing to rely on non-regionally adapted seed varieties may be creating unnecessary limits to a stronger, more resilient regional value chain.



"Growing organic cotton in the Carolinas again would be a game-changer for the domestic apparel industry. Providing the consumer with a local, organic option on a sustainable, transparent platform – going dirt to shirt in less than 500 miles – adds huge value to the textile value chain while helping revitalize rural communities."

- Eric Henry, TS Designs



FILLING GAPS, OVERCOMING OBSTACLES

PURSUING ORGANIC OPPORTUNITIES

Some opportunities to strengthen value chains are more difficult to see because the entire chain is relatively weak, or we simply lack hard data to map them. Based on our surveying and field work, we nevertheless identified several areas for potential expansion that require deeper research and analysis.

Source: Ben Haines/Looking Back Farm

FOOD-GRADE SOY.

Several buyers expressed a strong interest in more locally grown, certified organic soy for soy-based products such as tofu, tempeh, soy milk, and other vegetarian protein alternatives.

TRANSITIONING "NATURAL" PORK INTO CERTIFIED ORGANIC PORK.

In a region where hog farming remains huge and barbecue is sacred, developing pastured pork on clean, non-toxic, non-GMO fields and feed is a huge opportunity. Butchers and addedvalue pork processors expressed a strong interest in working with groups such as NC Choices, Firsthand Foods, and the NC Natural Hog Growers Association to explore this opportunity.

ORGANIC COTTON.

National apparel brands like Patagonia and local textile companies such as TS Designs are expressing renewed interested in organic Carolina cotton, after early trials.

KICKING THE TOBACCO HABIT.

Many organic farmers in NC got their start on organic tobacco, but increasing numbers recognize that further diversification and organic rotation systems need to be developed. NC State agronomists have developed trials with organic stevia, for example, which can use tobacco growing infrastructure, such as trays and curing barns.

THOUGHTFUL INFRASTRUCTURE.

Creating infrastructure for processing and milling diversified organic grains beyond soy and developing certified organic facilities for adding value to organic produce are clearly needed. However, entrepreneurs, economic development officials, and investors need to be attentive to region-wide opportunities to create "thoughtful infrastructure" that complements -- rather than duplicates -- efforts across the value chain.

DIVERSIFIED VEGETABLES AND PRODUCE.

Sweet corn, watermelons, leafy green, Irish potatoes, soft fruit and stone fruit, carrots, and tomatoes are among recurring crops mentioned in buyer and farmer interviews. Further research is needed on smaller crops where sales and price data are much spottier.

LABOR AND WORKFORCE ISSUES.

Growers repeatedly expressed frustration about labor issues, both for full-time farm help, which needs greater technical sophistication than in the past, and for seasonal labor affected by immigration law and uncertainties associated with wage rates set in the H2A program.

PUBLIC HEALTH IMPLICATIONS.

Considerable opportunities are emerging to link organic value chain development with the community-based work of public health practitioners who have expressed a strong interest in future collaboration. We look forward to deepening engagement with practitioners working particularly in low-income communities with high health disparities and concerns over access to affordable fresh, local, organic food. The region is well placed to build out a national model for a more "inclusive organic" food and agriculture system.

THE CRITICAL ROLE OF FINANCE.

Finally, given the relatively small scale of NC's organic farms, we need to develop appropriately scaled financing solutions to help them transition to organic and expand organic operations in sustainable ways. We view community development finance, impact investing, Slow Money, and new mechanisms for financing regenerative, organic agriculture as among leading opportunities to develop "integrated capital" solutions to building resilient value chains. Philanthropy has a critical role to play, alongside private investors, and public finance also needs to be mobilized. Last year while the OARS pilot project was underway, the five-year Upper Coastal Plain

Comprehensive Economic Development

Strategy for the Upper Coastal Plain of northeastern North Carolina was updated by the Upper Coastal Plain Council of Governments for the period 2017-22. For the first time organic food and agriculture, local and healthy food systems, and value chain development were explicitly identified as "strategic target sectors" for the region. As a designated Economic Development District through the US Department of Commerce, the region can access critical Economic Development Administration funding in order to pursue these strategic priorities. Mobilizing critical economic development funds and engaging with the Farm Credit system are other avenues that merit deeper investigation.







APPENDIX: ADDITIONAL DATA TABLES

Table 5 Top organic crops produced in the United States and in North Carolina, 2016

		Far	ms	Acr	es	Sales (d	State Rank of Sales	
		US	NC	US	NC	US	NC	
Al	l vegetables	3,121	81	186,178	4,335	1,644,431,203	31,666,249	
	SWEET POTATOES	285	47	9,647	3,235	100,992,908	20,734,490	2
	TOMATOES	1,057	25	12,435	123	174,973,246	5,227,426	3
	SQUASH	1,117	29	6,891	187	48,279,859	1,806,335	7
Al	l field crops	7,403	162	1,684,047	15,843	762,613,158	43,979,140	
	TOBACCO	251	119	9,996	6,391	62,395,202	38,975,521	1
	CORN FOR GRAIN	3,275	12	213,934	119	163,877,756	1,654,740	20
	SOYBEANS	1,748	33	124,591	2,388	78,490,532	1,315,145	9
	l berries and her fruits	2,366	29	39,886	214	659,863,173	1,365,083	
	BLUEBERRIES	455	18	5,359	197	100,482,177	965,336	6
	STRAWBERRIES	611	10	6,249	12	241,620,880	358,487	7
	GRAPES	712	5	27,358	30	218,400,863	176,488	5

Source: 2016 Certified Organic Survey, USDA, and Croatan Institute analysis.

Table 6 Organic chicken and eggs produced in North Carolina, 2016

		Farms		State Rank of Sales		
		US	NC	US	NC	
La	ying Hens and Eggs					
	CHICKEN EGGS	788	18	815,881,254	55,252,105	4
	CHICKENS - LAYERS	818	18	2,462,123	163,742	5

Source: 2016 Certified Organic Survey, USDA, and Croatan Institute analysis.

Table 7. Productivity factors for specific crops in US and NC

	\$ /a	cre	acres/	farm
	US	NC	US	NC
All vegetables	8,833	7,305	59.7	53.5
SWEET POTATOES	10,469	6,409	33.8	68.8
TOMATOES	14,071	42,499	11.8	4.9
SQUASH	7,006	9,660	6.2	6.4
All field crops	453	2,776	227.5	97.8
TOBACCO	6,242	6,099	39.8	53.7
CORN FOR GRAIN	766	13,905	65.3	9.9
SOYBEANS	630	551	71.3	72.4
All berries and other fruits	16,544	6,379	16.9	7.4
BLUEBERRIES	18,750	4,900	11.8	10.9
STRAWBERRIES	38,666	29,874	10.2	1.2
GRAPES	7,983	5,883	38.4	6.0

Source: 2016 Certified Organic Survey, USDA, and Croatan Institute analysis.

Table 8 Farms, land, and value of sales on certified organic farms, 2016

	United States	North Carolina	Growth	since 2015
	2016	2016	US	NC
Total certified farms	14,217	247	10.9%	21.7%
Total certified acres	5,019,496	31,800	15.1%	10.7%
Total certified sales (\$1,000)	7,553,872	144,917	22.6%	75.8%
Avg acres per farm	353.1	128.7	3.8%	-9.0%
Avg sales per farm	531.3	586.7	10.5%	44.5%
Avg sales per acre (\$1000/acre)	1.5	4.6	6.5%	58.8%

Source: 2016 Certified Organic Survey, USDA, and Croatan Institute analysis.

Table 9 North Carolina certified organic crops value of sales: 2016

Commodity	F	arms	Value of sales (dollars)		
	NC	% of US	NC	% of US	
All vegetables grown in the open	81	2.6%	31,666,249	1.9%	
All field crops	154	3.0%	43,979,14 0	5.8%	
All apples	(NDP)		(NDP)		
All grapes	5	0.7%	176,488	0.1%	
All berries	27	1.9%	(D)		
All other fruits (excludes apples, grapes, citrus fruits, and berries)	2	0.2%	(D)		
All tree nuts	(NDP)		(NDP)		

Source: 2016 Certified Organic Survey, USDA, and Croatan Institute analysis. (D) Withheld to avoid disclosing data for individual operations. (NDP) No data present.



Table 10 Certified organic floriculture crops, nursery crops, mushrooms, and vegetables/herbs under protection value of sales, 2016

Commodity	Farms	Value of sales (dollars)			
	NC	% of US	NC	% of US	
Floriculture and bedding crops	9	2.7%	297,000	1.2%	
Nursery crops, including aquatic plants	(NDP)		(NDP)		
Propagative materials sold	5	3.5%	(D)		
Mushrooms	1	0.9%	(D)		
Tomatoes grown under protection	7	1.2%	(D)		
Other vegetables and fresh herbs grown under protection	12	1.8%	421,958	1.1%	

Source: 2016 Certified Organic Survey, USDA, and Croatan Institute analysis. (D) Withheld to avoid disclosing data for individual operations. (NDP) No data present.

Table 11 Top certified organic livestock and poultry inventory and sales, 2016

Commodity		Peal	(Inventory		Value of sales (dollars)			
	Farms		Number		Number		Dollars	
	NC	% of US	NC	% of US	NC	% of US	NC	% of US
Milk cows	9	0.4%	701	0.3%	164	0.3%	275,324	0.5%
Beef cows	5	1.0%	206	0.4%	57	0.7%	79,962	0.8%
Other cattle	13	0.4%	598	0.2%	500	0.3%	610,765	0.4%
Hogs and pigs	1	0.7%	(D)		(D)		(D)	
Chickens - layers	18	2.2%	1,152,238	6.6%	791,959	14.4%	163,742	6.7%
Chickens - broilers	3	1.4%	(D)		(D)		(D)	

Source: 2016 Certified Organic Survey, USDA, and Croatan Institute analysis. (D) Withheld to avoid disclosing data for individual operations. (NDP) No data present.

Table 12 Top certified organic livestock products and poultry products sales, 2016

Commodity	Farms		Quant	ity	Dollars	
	NC	% of US	NC	% of US	NC	% of US
Milk from cows (pounds)	9	0.4%	9,112,330	0.2%	(D)	
Chicken eggs (dozens)	18	2.3%	24,517,894	7.1%	55,252,105	6.8%

Source: 2016 Certified Organic Survey, USDA, and Croatan Institute analysis. (D) Withheld to avoid disclosing data for individual operations. (NDP) No data present.

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