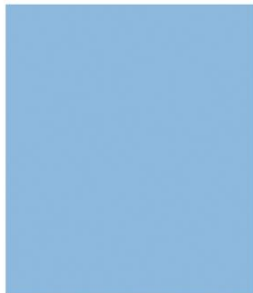
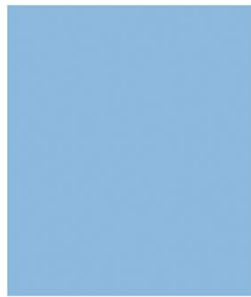


2022 ANNUAL REPORT

Cumberland County
University of Maine Cooperative Extension



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2022 Annual Report

Office of the Dean

Welcome to the University of Maine Cooperative Extension! We are located in every corner of the state in 16 county offices, research farms, 4-H camps and learning centers, and online. We are the largest outreach component of the University of Maine and reach more Maine people than any other entity within the seven campus University of Maine System. Our work is focused on helping Maine communities thrive and we do so by connecting people to research-based information, education and services. UMaine Cooperative Extension conducts the state's most successful out-of-school youth education program through 4-H, empowering young people to reach their full potential. Our youth programming also includes our 4-H camps and learning centers which provide opportunities for youth to engage in outdoor experiential learning. Extension also helps support, sustain, and grow the food-based economy across the entire state of Maine. In addition, we provide valuable statewide programming in nutrition education, healthy families and communities and within the aquaculture industry. We also partner with other organizations and programs to provide additional educational opportunities to a diversity of audiences across this state.



Extension faculty and staff across the state have also contributed to significant digital outreach this past year. Our Extension website (extension.umaine.edu), which is a combination of 57 interconnected websites, received 3.1 million views in 2021. We have over 700 research-based publications that are available as free downloads at extension.umaine.edu/publications. And in this past year, we had more than 5,000 customers register for workshops, events, webinars and more through our online registration system.

UMaine Cooperative Extension is determined to make a positive difference in our areas of excellence and beyond for the citizens of Maine. Explore our website, visit a county office, and contact our enthusiastic workforce.

— Hannah Carter, Dean

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*Putting university research to work in Maine homes, businesses,
farms, and communities for over 100 years*

University of Maine Cooperative Extension's 2022 Digital Presence

Website

University of Maine Cooperative Extension's website at extension.umaine.edu – a combination of **57 interconnected websites** consisting of nearly **12,000 pages** – received **3.1 million pageviews** from visitors in the 12 months between January 1, 2022 and December 31, 2022. Visitors searched for and found information on a wide variety of topics, including planting in Maine, small business management, harvest and storage of tree fruits, and tractor safety. Image galleries helped users identify pests, plant diseases, and weeds. A wide variety of interactive web forms allowed users to request assistance, presentations, newsletters, and updates; report volunteer hours; make donations; and respond to surveys. Nearly **54,000 web visits were referred from social media**.

Social Media

More than **43,000 followers** followed or were subscribed to UMaine Extension's **55 county and program-specific social media accounts** on Facebook, Twitter, YouTube, Pinterest, Instagram, and TikTok. We hosted or co-hosted **92 Facebook Events that reached 127,731 users**. Nearly **700 educational videos** were available to visitors on our 14 YouTube playlists; many were also embedded in our web pages. Extension's YouTube videos were the most watched on the University of Maine Channel, which received **1.2 million views and 66,000+ hours** of watch time. Top videos included Lobster Cooking and Eating, How to Seal Windows for Winter and Summer, How to Prune a Blueberry Bush, How Do I Prune Raspberries, and Tick Removal.

Publications

More than **700 research-based publications** on a broad range of topics were available for free download at extension.umaine.edu/publications. Popular fact sheets, such as *How to Tap Maple Trees and Make Maple Syrup*, *Sodium Content of Your Food*, and *Guide to First-Time Horse Ownership* received tens of thousands of pageviews each. New publications in 2022 included *Tarping in the Northeast: A Guide for Small Farms*, *Establishing and Using a Support Network for Individuals with Disabilities*, *Hawkweed in Maine Lawns*, *Growing Wild Blueberries in the Home Garden*, and *Calf and Heifer Management in New England*.

Online Registration, Brightspace, and MailChimp

Nearly **2,642 customers registered for workshops, events, webinars, and more** through our online registration system.

Over **500 participants took Extension courses online via BrightSpace**. Classes included Master Gardener Volunteer training, Maine Gardener Training, Growing Hemp, Soil Health, Boots-2-Bushels, Food Sanitation, Maine Horticulture Apprenticeship, 4-H STEM Ambassador Training, and So, You Want to Farm in Maine.

Extension also collaborated with three partners across the University of Maine System to develop, test, and launch a new e-commerce platform, Discover.maine.edu, that will be used for non-academic course enrollment.

More than **11,032 subscribers received over 75,500 e-notifications via MailChimp**.



Maine Food System



Maine Harvest for Hunger Fights Food Insecurity

Relevance — Maine has the second highest rate of food insecurity in New England and ranks 35th in the nation. The USDA estimates that 9.5% of Maine households are food insecure. Nationally, 12.5% of households with children under the age of 18 and 9.5% of households where an older adult was living alone experienced food insecurity in 2021. With hunger affecting people of all walks of life in all communities, it is essential that every measure be taken to feed our neighbors in times of need.

Response — Since 2000, UMaine Extension’s Maine Harvest for Hunger (MHH) program has mobilized gardeners, farmers, businesses, schools, and civic groups to grow, glean, and donate fresh produce to food security agencies. Our work involves training volunteers, developing partnerships with farms and organizations, organizing and leading volunteer opportunities, maintaining databases of sites accepting produce donations, and building awareness of the extent, causes, and impacts of food insecurity.

Results — In 2022, 262 MHH volunteers grew, gleaned, and distributed 296,150 pounds of produce, valued at \$568,608, to 204 food security agencies located throughout the state. We partnered with 131 farms and community gardens on these efforts. Notably this year, our teams gathered and distributed 14,000 pounds of apples from orchards throughout the state. These farms reach out to us to annually organize gleaning events, knowing our trained volunteers can be trusted to safely and efficiently get their apples to where they’re needed most. Old Town Elementary School’s free farm stand offered 6,300 pounds of fresh fruits and vegetables gathered on-site and gleaned from area farms. Open to the public in an easily accessible site, this low-barrier program reached hundreds of individuals in a limited resource community. From backyards to farms to school gardens, MHH is enhancing access to healthy food and offering volunteers a truly meaningful way to engage with their community. Since 2000, MHH participants have distributed more than 3.5 million pounds of food to citizens grappling with hunger.

Master Gardener Volunteers Help Increase Food Security and Lift Communities

Relevance — Public and private gardens are important tools for enhancing physical and mental health. They also play a key role in sustaining the health and vitality of our natural communities. Successful collaborative gardening initiatives are an important tool for enhancing public health and providing meaningful community engagement opportunities by increasing access to locally grown food, providing a

safe space to connect with neighbors, and offering learning opportunities outside the classroom. Supports such as volunteer leaders, educational resources, and manual labor are key contributors to the success of these projects. Extension trains and supports Master Gardener Volunteers, who help extend university knowledge to their neighbors through the teaching of sustainable gardening practices.

Response — The Master Gardener Volunteers (MGV) program provides participants with a minimum of 64 hours of in-depth training in the art and science of horticulture. Trainees receive current, research-based information from our educators and industry experts and are connected with service projects that match their interests, skill sets, and availability. MGV coordinators facilitate relationships between MGVs and community partners, assisting with needs assessment, program planning, risk management, and problem-solving. MGVs play a vital role in connecting communities with educational resources through community events, social media, and programming.

Results — In 2022, 664 volunteers donated 30,262 hours to a variety of educational and food security projects throughout the state, including 23 school gardens, 16 demonstration gardens, 12 horticulture therapy gardens, 13 pollinator and native gardens, and 56 food security projects. Their efforts reached 1,744 youth and adults through direct programming and 7,452 Maine residents indirectly through outreach, news articles, TV features, and more. Many volunteers enter the MGV program with the goal of improving their gardening skills for their own personal benefit and leave surprised by how deeply involved and passionate they become about community projects.

Expanded Food and Nutrition Education Program Increases Food Security and Healthy Behaviors

Relevance — In 2021, 11.5% of Maine people lived in poverty, and in 2020, 10.4% of households experienced food insecurity. In 2020, 31% of Maine adults were obese. The combination of high rates of food insecurity and the complexity of the causes of obesity increases the risk of developing chronic diseases and reducing the quality of life for Maine people. High incidence of chronic diseases continues to raise health care costs for the nation and strains current health promotion programs.

Response — To improve the food security and diet quality of Maine's low-income parents and caregivers, UMaine Extension delivers education through the Expanded Food and Nutrition Education Program (EFNEP). The goals are to improve behaviors related to diet quality and daily physical activity, and to use food resources management practices to plan and shop for healthy meals and snacks. Program outcomes are measured for all adults using validated pre/post program surveys.

Results— In 2022, 233 adults participated in Maine EFNEP, and the education delivered reached a total of 958 individuals in program families. Sixty percent completed pre- and post- surveys showing these results:

- 38% report eating fruit more often each day
- 42% report eating vegetables more often each day
- 29% report drinking soda less often
- 43% report planning meals before shopping more often
- 33% report making a list before shopping more often
- 45% report using a weekly or monthly food spending plan.

Seafood Processing Education and Validation Helps Ensure Safety of Maine Seafood Products

Relevance — The Maine seafood industry adds more than \$2 billion to the state economy annually. Maine seafood producers must complete training in seafood hazard analysis and critical control points (HACCP) principles as required by U.S. Food and Drug Administration (FDA) regulation. Processors that are cooking products must complete a thermal processing validation performed by a thermal process authority.

Response — Extension provides education and process validation services to seafood processors in Maine and the United States to ensure the proper processing of products to prevent foodborne illness. This service allows processors to meet FDA requirements and sell safe seafood products. In 2022, Extension delivered eight seafood HACCP trainings and provided six thermal process validations.

Results — More than 200 seafood processors participated in the trainings, and more than 40 participants reported that they assembled and updated seafood HACCP plans to safely produce seafood products and meet FDA regulations. In addition, the six thermal processing validation studies completed for three processing plants allow the plants' workers to safely produce more than 2,000,000 pounds of seafood products annually with an estimated value of more than \$20 million.

Helping Culinary Arts Instructors Build Agriculture Literacy through an Immersive Culinary Experience

Relevance — The USDA 2018 Food Away from Home data reveal that since 2010 more than 50% of meals are eaten away from home. Restaurants are a driving force in Maine's economy, providing 63,900 jobs, which represents 10% of Maine's employment. The COVID-19 pandemic reinforced the need for a sustainable local agriculture-based food system within the restaurant and food service industry to support reliable, stable food access.

Response — UMaine Extension and Maine Ag in the Classroom collaborated to create the Building Agriculture Literacy through an Immersive Culinary Experience project to help career and technical education (CTE) culinary arts instructors increase their agricultural literacy and enhance the connectedness between agriculture and food service. This project seeks to create a skilled and educated workforce that will increase the usage of Maine-grown, -processed, and -produced foods in their programs and careers. Project activities included a weeklong Immersive Culinary Arts Summer Institute for CTE culinary arts instructors, hands-on experience in local food procurement practices, demonstrations of food system lessons, educational field trips, financial support for experiential activities through their existing school restaurants, participation in a University of Maine Local Foods Competition, and coaching during the school year.

Results — At the program midpoint, we had reached 74% of Maine's high school CTE culinary arts programs with at least one of our efforts. More than 800 students statewide have engaged in classroom/kitchen visits to learn about dietary restrictions, consumer food preferences, and local foods, and complete a local food cooking challenge to meet a dietary food preference, thus demonstrating their proficiency in local foods and dietary restrictions. Thirteen schools received \$28,000 in funds through a mini-grant program to support activities to develop their knowledge base of agricultural literacy. The Culinary Arts Summer Institute reached nearly 30% of Maine's culinary arts chef instructors. This immersive event involved experiential learning opportunities at multiple Maine food processing and production sites across the state.

The program is contributing to the success of Maine's local food system by changing the way tomorrow's food professionals think about food. Through the project's emphasis on local food systems through strategic career-readiness, experiential education, and connecting with local stakeholders (career and higher education), these students are gaining a realization of the importance and value of local foods. Our project requires CTE culinary arts programs selected for mini-grant funding to be engaged at the local level with stakeholders related to culinary arts and hospitality, including nonprofit organizations, community groups, private businesses, industry representatives, and higher education faculty and staff at Maine community colleges and universities. This type of community connectedness is fostering youth leadership and offering opportunities for students to develop a greater understanding of federal, state, and local food and agriculture policy and to network to make tangible connections for future careers.

Integrated Pest Management Saves Millions for Maine Potato and Fruit Tree Industries

Relevance — The potato industry is the largest agricultural sector in Maine, encompassing more than 530 businesses generating total sales of more than \$540 million with total employment of 6,150 jobs and a total income greater than \$233 million annually. The Maine potato crop, which in 2022 was 1.8 billion pounds, has its challenges from insects and pathogens alike. Costs to manage these pests can eat up profitability of the crop, and insecticide applications used to manage these pests can pose threats to the applicators, non-target species, and the environment. Additionally, Maine's tree fruit sector is vibrant, active, and growing.

Response — The University of Maine Cooperative Extension Diagnostic Research Laboratory provides pest identification and integrated pest management (IPM) education to commercial and home clients. IPM is a comprehensive approach to solving pest problems with the goal of providing safe, effective, economical, environmentally sound, and socially sensitive outcomes.

Extension's Potato IPM program worked with 270 farms to monitor pest populations in potato fields in northern and central Maine. Using insect traps and field scouting, farms were visited weekly during the growing season to determine pest population status, and growers were given field reports and up-to-date management recommendations. Data collected from the potato farms were shared with potato growers throughout the state, the northeastern states, and eastern Canada through a weekly newsletter with 456 subscribers.

Growers using the information available through the IPM program have been able to successfully manage potato pests using minimal pesticide applications, because sprays were used only when population data indicated a specific need for control. Yields were improved or pesticide sprays reduced, and due to less pest damage, profitability was maintained or improved.

Extension's Tree Fruits program staff developed and delivered research-based information on the production of tree fruit crops, primarily apples, through publications, workshops, meetings, farm visits, correspondence, and telephone consultations. We conduct annual meetings, including on preseason IPM in March and a summer tour in July. Periodic newsletters address current cultural practices and pest management strategies. We maintain applied research plantings in cooperation with the Maine Agricultural & Forest Experiment Station.

Results — Each year, Extension's IPM research and identification efforts save Maine's potato industry an estimated \$10 million in losses avoided, yields increased, and pesticide uses reduced. The IPM program saves Maine's fruit tree industry more than \$5 million in losses avoided and more than \$1 million in pesticide cost savings.

Supporting Maple Producers and Encouraging Workforce Development

Relevance — Maine has the third largest maple production in the United States, behind Vermont and New York. Maine's maple industry has an estimated annual statewide economic contribution of more than \$48 million in output, 805 full- and part-time jobs, and more than \$25 million in labor income. Maine's maple industry annually produces more than 700,000 gallons of maple syrup.

Response — In 2004, a grant from the Maine Agriculture Center funded a collaborative effort by UMaine Extension, University of New Hampshire Extension, and the Vermont Agency of Agriculture, Food, and Markets to create an International Maple Syrup Institute (IMSI) Maple Grading School. To meet ongoing demand, the Grading School has been held annually and has been adopted by the IMSI as a signature event aligned with the IMSI mission to protect the quality and integrity of maple products. School attendees are from all areas of the industry: producers, bulk buyers and syrup packers, Department of Agriculture inspectors, Extension personnel, and chefs. Extension's maple education programs provide producers with resources about international grade standards, maple grading techniques, quality control, and food safety in the production process. A revamped UMaine Extension Maple Syrup Production

website contains information on access to financial and business management resources, maple quality control, labor management, and expanded information for beginning producers.

Results — In 2022,

- 1,192 members of the public learned about the maple industry, syrup grades, and diverse uses of syrup through direct contact and through podcasts
- 116 beginning or backyard sugarmakers participated in four Maple Sugarmaking 101 courses led by our team
- 32 commercial maple syrup producers gained expertise with grading and quality control of maple syrup
- a six-week 4-H club engaged 25 youth, ages 9–16, including an in-person workshop at a Maine maple sugar house.

Youth learned about tree ages, identification, versatility of commercial and ecosystem benefits, the diversity of forest-related careers, and tapping maple trees. Youth interacted with forest industry professionals and received kits for accompanying hands-on activities, including tree cookie ornaments, identification books, maple candies, and maple syrup thickness and taste samples.

For 19 years, the Grading School has helped promote the wholesome image of the maple industry and shown that its participants are high quality and careful producers of unique maple products. The continued success of the school and its participants helps promote the exceptional image of both the maple industry and its producers who create high-quality products. The perpetuation of the school provides an excellent platform for industry discussion and education about maple products, grading, and quality issues concerning pure maple syrup. The school has received media attention including news articles by the Associated Press and National Public Radio, as well as local television and print media.

Home Horticulture Programs Help Gardeners Increase Yields and Efficiency and Reduce Inputs

Relevance — Every day, Maine gardeners are deciding on whether and how to manage pests, which fertilizers to use and how much, which plants to grow, methods to cultivate the soil, and how to use water resources to maintain landscapes. Nearly every residential site has a landscape that requires maintenance, and decisions made in these sites can have a significant impact on our natural resources. Home gardener success also results in improved food security and has an economic role in our green industry.

Response — In 2022, home horticulture programming directly reached 8,650 adults and 733 youth through more than 365 hours of educational programs, both in-person and virtual. This included 4,052 questions, received via email, phone calls, in-person events, and walk-ins, that were answered for home gardeners. Garden-related videos, newsletters, newspaper columns, and publications from Cooperative Extension indirectly reached an additional 49,679 home gardeners.

Results — As a result of Extension programs, participants reported using Extension to identify pest problems and determine research-based management strategies; develop a new garden or expand an existing one; increase garden yields and consumption of home-grown food; adopt sustainable gardening practices, including techniques to improve soil quality and practices that improve efficiency, reduce inputs, and negative impacts; adopt and maintain integrated pest management strategies; and adopt water-saving techniques.

Maine Compost Schools Train Respondents for Animal Disease Outbreaks and Disaster Mortalities

Relevance — There is a national need for compost education as we move toward a more environmentally sustainable society. Composting is a management tool that a variety of sectors can use to reduce waste volume through decomposition and stabilization. Composting can reduce food waste, manage animal mortalities, stop the spread of disease, and create a valuable and safe product that can be used in the agricultural, horticultural, and environmental engineering sectors.

Response — UMaine Extension, as a member of the Maine Compost School team, offers weeklong training multiple times a year focused on comprehensive composting training and composting as a means to manage animal mortalities through general agricultural production, disease outbreaks, or disaster mortalities. Participants in these trainings are tested on their composting knowledge and receive recognized certification.

Results — The nation's longest continually running compost education program (27 years), the MCS has graduated more than 1,000 students from most of the 50 US states and over 40 countries from around the world. Participants have used the training as professional development and as a way to bring a more robust and rounded set of composting skills back to various businesses to improve understanding, efficiency, and profitability. More than 75 participants have completed our Carcass Management Training Programs have passed the initial requirements to become a Composting Subject Matter Expert (SME) and may deploy during animal mortality outbreaks due to diseases such as highly pathogenic avian influenza (HPAI) and other disaster events. Fourteen participants responded to the 2022 HPAI outbreak and are now full compost SMEs.

Results of the Carcass Training Program include the establishment of a trained community/team that is prepared to rapidly and expertly respond to animal disasters; understands core compost concepts that can be applied to many different situations; have competencies in carcass mortality management and have resource materials they can share with others; understands how to assess and troubleshoot unique issues to effectively use compost as a disposal tool.

Teaching Climate Adaptation to Farmers and Service Providers

Relevance — Current and projected changes in weather present new opportunities for Maine agriculture, such as longer growing seasons, but also increased risks, such as spring frosts, summer droughts, and more frequent and intense rainfall. In many cases, climate adaptation practices (e.g., irrigation and weather-based decision support tools) require new knowledge and skills, not just for the farmer but also for their service providers.

Response — UMaine Extension initiated a three-year Northeast Sustainable Agriculture Research and Education (SARE) professional development program to increase the ability of agricultural service providers to help farmers adopt climate adaptation practices, with each focused on a set of specific practices. The aim is not to create topic experts, but to help trainees become well-informed advisors who, in the context of their current positions, will help farmers frame the right questions, address relevant considerations, evaluate options, and connect with the most appropriate resources and experts.

Results — Agricultural service providers from Extension, nonprofits, state agencies, conservation districts, and the University of Maine increased their knowledge, skills, and confidence in providing information and recommendations about irrigation and other practices to cope with the increased frequency of dry spells and drought. Participants: 1) learned about water sourcing, water rules and regulations, types of irrigation systems, irrigation management and efficiency, and drought and water monitoring through farm tours and monthly webinars, 2) applied their knowledge by working in teams with farmers to develop farm plans for reducing the risks associated with increased drought and dry spells, and 3) co-developed the "Directory of Resources on Irrigation in Maine," a curated list of more than 50 online resources covering all aspects of irrigation that will be posted on the UMaine Extension website for farmers and agricultural service providers to use.

Extension Shares PFAS Resources for Farmers

Relevance — “PFAS” is the short name for a large class of harmful, fluorinated synthetic chemicals that have recently been found in the environment, often at low levels. Higher levels are sometimes found near airfields and factories that have used fire-fighting foams, or on land where certain waste materials or biosolids containing PFAS have been used. Crops may be grown on soil containing these PFAS, but how much of these chemicals are in the crop depends on the type of crop, what part of the crop is edible, soil properties, and PFAS levels in the soil. These chemicals may end up in the milk and meat of animals fed crops such as hay containing PFAS. These chemicals can also move from the soil into the groundwater and into well water. Consuming contaminated milk, meat, plants, or water are potential ways people can be exposed to these chemicals.

Response — The state of Maine has allocated significant funding to address issues related to PFAS and is dedicated to supporting landowners who are affected by land application of wastewater biosolids and fire-fighting foams, as well as Department of Defense sites, landfills, or other PFAS sources.

Results — UMaine Extension offers a dynamic set of resources about on-farm PFAS contamination available online to the public in one location. [Guide to Investigating PFAS Risk on Your Farm](#) is a comprehensive collection of resources about PFAS contamination in Maine. Topics include information on the sources of PFAS contamination, steps to determining risks and mitigation options for farms, and Maine’s response to contamination at agricultural sites. The website is continually updated as the research and resulting information evolves. The resources are from multiple Maine state agencies, including the Departments of Agriculture, Conservation and Forestry; Health and Human Services; and Environmental Protection; and the Center for Disease Control and Prevention. Supporting organizations contributing information include UMaine Extension, Maine Farmland Trust, and Maine Organic Farmers and Gardeners Association.

So You Want to Farm in Maine Program Educates Potential New Farmers

Relevance — Current farmers thinking about changing farm enterprises and new farmers interested in starting a farm may lack the skills, knowledge, and confidence to investigate their options to start, adapt, and maintain a profitable land-based business. Major issues farmers and potential farmers (whether full-time or part-time) need to overcome include access to capital, understanding of rules and regulations affecting agriculture operations, and marketing options.

Response — Since 2015, 349 people have participated through face-to-face, video-linked, webinar, live-streamed, Zoom, and archived sessions of the So You Want to Farm in Maine program to learn about agriculture enterprise selection, business planning, record-keeping, market research, regulations, and resource identification. Each class is designed to be interactive and features many guest speakers, including agriculture service providers from an array of sectors and those who are currently farming successfully.

The 2022 series offered a different approach. Participants included 44 aspiring farmers as well as 13 UMaine undergraduates, providing the opportunity for richer discussions and connections between those interested in starting Maine farms imminently and students with a variety of backgrounds and experience. The undergraduates were teamed with aspiring farmers to create draft business plans and enterprise budgets over the course of five weeks.

Results — Knowledge change was assessed by a post-program evaluation. Participants responding to a program evaluation reported having moderate to considerable knowledge and understanding of these topics following the program: goal setting and farm business management plan development; enterprise budget development and evaluating profitability; land and asset assessment; marketing and marketing research; record-keeping (production and financial); estate planning and insurance; permits, licenses, and regulations; credible sources of production information and pricing; taxes (local, state, and federal); and financial management. In 2022, income from all plans developed for the class by students and farmers

totaled more than \$2 million. All participants had the opportunity to receive USDA Farm Service Agency (FSA) borrower training credit; in 2022, 22 participants chose to get the FSA certification.

Soil Health Course Educates Farmers

Relevance — Soil health is of great interest to agricultural producers and a critical component of their success, yet farmers have limited access to in-depth training in the topic.

Response — Extension designed a new, 5-week online soil health short course for farmers to improve their understanding of soil health science, principles, and practical management strategies. Course topics included soil biology and soil organic matter, physical and chemical properties of soil health, soil health strategies and practices, cover cropping, reduced tillage practices, crop rotation, soil amendments, and soil health testing.

Results — Twenty participants completed the course, including nine farmers, five aspiring farmers, four gardeners, and two farm advisors. Fourteen said they intended to change a soil management practice as a result of what they learned, and 10 submitted soil for a free soil health test and received a follow-up consultation with one of the instructors.

Marine Extension Team Supports Community Sustainability/Resilience, Fisheries and Aquaculture, and Ecosystem Health

Relevance — Climate change is requiring Maine communities to build the capacity to make informed decisions on the management of coastal and marine resources that promote ecological and economic sustainability.

Response: Maine's Marine Extension Team (MET), a collaboration of University of Maine Cooperative Extension and Sea Grant, continued to help communities gain the capacity to make informed decisions on the management of coastal and marine resources that promote ecological and economic sustainability. MET members worked with communities to address problems and respond to opportunities in four major areas: ecosystem health; sustainable coastal communities; fisheries and aquaculture, and coastal community resilience.

Results: Our collaboration benefits Maine broadly by marrying Extension's outreach and programming experience with Sea Grant's marine research and knowledge of coastal communities and issues. Through research and outreach the Marine Extension Team builds the capacity of coastal communities and marine industries to make informed decisions on the management of coastal and marine resources that promote ecological and economic sustainability. In 2022, our projects included *Building Your Virtual Facilitation Skills*, a training series in partnership with UMaine Extension educators in four states, last year training 82 professionals and community members in Maine; *Advancing Scallop Aquaculture in Maine*, a partnership with UMaine and Bigelow Laboratory scientists, Coastal Enterprises, Inc., Maine Aquaculture Association, and Maine scallop farmers to develop a bioeconomic model for scallop farming and develop new scallop aquaculture products; *Tools for Maine's climate-readiness practitioners and coastal communities*, as part of our work with the Climate Change Adaptation Providers Network; *Beach Profile Monitoring*, working with more than 150 volunteers collecting beach profile data and providing valuable information for municipal officials, and with the Maine Climate Council's Scientific and Technical subcommittee and to inform *Maine Won't Wait*, a climate action plan for the state, *The Maine Oyster Trail*, continuing to support Maine's oyster farmers with the first digital and interactive oyster trail in the U.S., partnering with more than 80 Maine oyster farms and businesses to drive coordinated tourism to Maine's working waterfronts; *Aquaculture in Shared Waters*, continuing to support fishermen and others to start aquaculture ventures, with a 12-week introductory courses including curriculum related to collaboration opportunities with the tourism and culinary industries, and incorporating the results of Sea Grant-supported UMaine research on aquaculture site selection; *The Alliance for Maine's Marine Economy* that facilitates innovation and growth, allowing seafood businesses and the marine technology sector to develop new products, increase revenue, and create jobs. A MET professional has coordinated the

Alliance since January 2018, and cumulatively, Alliance investment recipients have reported that their awards and Maine Sea Grant's Alliance extension programming and support have resulted in 215 new and 211 expanded jobs, and 105 new contracts and research projects.



4-H POSITIVE Youth Development

4-H Ambassadors Mentoring Students toward STEM Careers

Relevance — Developing Maine youth science, technology, engineering, and math (STEM) literacy is vital to ensuring that our state continues to thrive economically and socially. Given the remote and diverse communities where Maine youth live, informal education can help minimize inequities in rural youth STEM education and career pipelines. Future career opportunities in Maine will depend heavily on STEM skills, whether in the growing fields of healthcare and engineering, or in positions requiring technical skills, such as construction, and maintenance of transportation and energy systems.

Response — 4-H STEM Ambassadors are trained University of Maine System students enrolled as 4-H volunteers who facilitate hands-on STEM activities with youth 8–14 years old throughout Maine. Since 2014, our 4-H STEM Ambassadors program has enrolled and trained more than 500 UMaine system students who have facilitated in-person, hands-on learning experiences fostering youth STEM enjoyment, literacy, and identity, reaching more than 6,000 Maine youth in classrooms, libraries, and after-school clubs across the state. In fall 2020, Extension redesigned the program to be virtual, including a training, mentoring, and experiential STEM programming.

Results — The shift to a virtual program allowed for multicampus student teams and increased access for more distant community partners regardless of local program model (remote, in-person, hybrid). In 2021 the program reached more than 300 students, grades 3–8, across 18 sites with the help of 39 volunteer Ambassadors and staff. In 2022 program staff spent the first part of the year upgrading the virtual programming and then reached another 89 students at seven sites with the help of 11 Ambassadors. Through this program, youth ages 8–14 come to view these Ambassadors as mentors and leaders in their community while also developing skills in STEM through hands-on activities and becoming connected to research, resources, and scientists at Maine’s public universities.

Summer of Science STEM Enrichment for Children Experiencing Poverty and Immigrant and Refugee Families

Relevance — Children experiencing poverty have less access to enrichment activities, contributing to an achievement gap between them and their more affluent classmates. This gap accelerates during summer months, when children from low resource backgrounds tend to fall behind in grade equivalency compared to their peers. This condition can be especially acute for children living in public housing neighborhoods, including many of Maine’s immigrant and refugee families in the metro areas of Portland and Lewiston. Access to STEM enrichment activities leads to improved academic success, more educational attainment, and better employment opportunities.

Response — UMaine Extension created the 4-H Summer of Science (SOS) in 2012 to: 1) improve youth aspirations in STEM, 2) introduce STEM careers to youth, and 3) mitigate summer learning loss and the achievement gap. Over time, the SOS program has developed to include teens as teachers and college interns as teacher mentors. In 2022, UMaine 4-H faculty and staff designed four STEM lessons that were taught in seven southern Maine communities at 15 sites, including Boys & Girls Clubs, the YMCA, summer lunch programs, public housing centers, and libraries. There were 153 adult volunteers and summer staff who taught 535 youth in the field of environmental DNA (eDNA). Forty-eight percent of youth participants were non-white (225 of them of black or African American origin).

SOS is unique among STEM programs in using teens to be the teachers; SOS is often the first paid position for our teens. These teens were trained to deliver lessons, understand content, manage classrooms, motivate young learners, and work with community partners. Seven college interns were recruited, trained, and tasked with mentoring the teen teachers, thereby creating an integrated generational approach to delivering community programming. The college interns and teen teachers gained workforce skills such as time management, leadership, public speaking, problem-solving, ethics, and teamwork. Funding for stipends for the teens and college students came from USDA NIFA, Portland Public Schools, and the UMaine EPSCoR program.

The SOS program focuses on programming where youth already are (in neighborhoods, libraries, and community sites) and uses positive 4-H youth development practices to reduce barriers to STEM activities. By engaging in Summer of Science activities, the 4-H youth are well poised to return to their academic school year with reduced summer learning loss and an increased interest in science.

Results — Research by UMaine faculty shows that well-designed STEM lessons delivered by near peers (teens and college students) supports STEM career aspirations and leads to better content knowledge. Research also shows that youth involved in 4-H are more likely to pursue future courses or a career in science, engineering, or computer technology, which can lead to improved employment opportunities. For Maine elementary school youth, SOS supports narrowing their STEM achievement gap during summer months, and for the teens trained to deliver programming, it fosters their career development, leadership abilities, and sense of responsibility. Teen teachers in the SOS program report improved socio-emotional skills and applicable workforce skills, as well as increased resiliency.

4-H Aquaponics Project Sparking Youth Interest and Workforce Development

Relevance — Maine communities have a long tradition of harvesting healthy seafood and taking care of the environment. Maine aquaculturists are leading suppliers of fresh, sustainable, and locally grown seafood, and as a result, aquaculture is one of the fastest growing industries in the state. Maine aquaculture generates more than \$137 million in sales output, 1,975 full- and part-time jobs, and \$56 million in labor income annually, and there is an increasing need to grow the local workforce to support the growing industry.

As a global leader in the aquaculture industry, Maine is uniquely positioned to engage youth in aquaculture education programs that will help grow and strengthen local businesses and the economy. A workforce shortage in Maine's aquaculture industry has been an obstacle to growth for many businesses and could stunt the industry's tremendous growth potential.

The recirculating aquaculture system sector is booming, with five large-scale companies recently investing in Maine, bringing economic benefits to rural communities. Hancock County in particular has a thriving aquaculture industry due to its coastal location and access to the UMaine Center for Cooperative Aquaculture Research (CCAR). To support this growing industry, effective workforce development programs must provide the flow of talent needed to create and sustain a robust aquaculture industry. With roots in agriculture and animal science, the 4-H Youth Development Program of UMaine Extension is a natural fit for aquaculture advancement programs.

Response — In 2022, Hancock County 4-H partnered with CCAR and the Aquaculture Research Institute to expand the 4-H Aquaponics project, an experiential learning program for K–12 youth that includes learning experiences in introductory aquaponic systems and design, fish husbandry, aquaponic gardening, cooking and nutrition, and more. Youth practice important life skills such as record-keeping, problem-solving, food safety, collaboration/teamwork, science and math literacy. They can participate in the project from home, from their classroom, or any other youth group setting, such as after-school programs, summer camps, etc.

Results — Youth participants gained a deep understanding of novel, complex systems, while practicing important life skills such as resiliency and troubleshooting. They also developed skills that are sought after by the aquaculture industry (e.g., basic knowledge of fish biology, understanding water quality issues, project management, teamwork, and more), specifically related to recirculating aquaculture systems. The 4-H Aquaponics project is being lauded as a viable workforce development program for the aquaculture sector in Maine and nationally. It was externally funded for 2022 and beyond and received the 2021 Denise Miller National 4-H Innovator Award from the National Association of Extension 4-H Youth Development Professionals.

NorthStar Program Raises Student Aspirations

Relevance — Many employers now require bachelor's degrees for an increasingly wider range of jobs, and there is a significant achievement and mental health gap for rural Maine youth. According to the 2021 Maine Integrated Youth Health Survey, one in five Maine students have experienced more than four adverse childhood experiences that significantly impact health and behavior outcomes. The percent of Oxford County residents with a bachelor's degree (20.6%) is far below state and national averages. Isolation, lack of social capital, and access to important resources are related challenges for these rural youth.

Response — Based in rural western Maine, NorthStar is a 4-H mentoring program that raises youth aspirations via long-term adult and peer relationships, part of a statewide network called Aspirations Incubator (AI). Students are recruited in seventh grade, referred by a teacher or parent, and are mentored through graduation. Cohorts are formed by grade level and meet monthly to plan and execute yearly “core trips,” which include community service, cultural exchange, outdoor adventure, college visits, and career shadowing. NorthStar offers many other activities based on student interest and community need, and refers students to local employment.

Results — The program's first six years have been promising. Our first cohort is about to graduate from high school, with 90% planning to go to college this fall. All of these students report feeling more connected to their community, and 75% of them report a positive change in their relationship with adults and peers because of NorthStar. NorthStar staff and volunteers have acted as frontline support for teens in the SAD44 community, providing a much-needed bridge to available support services and direct support in numerous crisis situations. More than 70% of students in the program reported experiencing positive growth on measures related to learning interest and critical thinking. AI students were half as likely to be chronically absent compared with their peers, and more likely to exceed academic expectations. The majority of AI students reported improvements in their peer and adult relationships each year. In Year Four, 89% of eighth graders in Cohort Three agreed that the program had helped them to feel connected to their community, and 86% said they have people to talk with when they feel lonely.

4-H Summer Camp and Learning Centers

Connecting Youth to the Outdoors and Building Community

Relevance — Research has shown that positive social and emotional learning experiences can significantly impact youth development and connecting youth to a positive adult role model decreases the risk for making unhealthy choices or engaging in risky behaviors. With youth spending more time connected to social media and other digital platforms resulting in isolation and sedentary indoor time, many youth suffer from obesity and/or ADHD, and some lack opportunities to develop positive interpersonal communication skills.

Response — UMaine Extension 4-H Camp and Learning Centers provide programs for youth ages 4-17, many from underserved populations, to have transformational experiences designed to develop a sense of place and belonging, and confidence in the outdoors. Our programs include both day and residential summer camps, onsite open-air classrooms for schools, and school-based programs, as well as adult programming and workshops. We have a well-developed virtual component to our programs that gives them added depth and maximizes accessibility. Our Learning Centers typically attract more than 2,500 youth each summer, and provide school programming for more than 6,000 students from 60+ Maine school groups.

Results — In 2022, our 4-H Camp and Learning Centers:

- Delivered year-round programming at the UMaine 4-H Learning Centers at Blueberry Cove, Bryant Pond, and Tanglewood, including programs in water ecology, forest ecology, wilderness survival, and conservation education.
- Collaborated with NH and VT developed and delivered an AgriSTEM curriculum virtually and in person among the three states to over 600 students, including summer campers at 4-H centers.
- Continued to support Telstar Freshman Academy at Bryant Pond, offering daily, yearlong, experiential learning designed to engage students in an outdoor setting.
- Continued to deliver the NorthStar Youth Mentoring program that connects young people with caring adults through community engagement, cultural exchange, and adventure challenge and leadership. The program is grounded in in-person contact, and also uses virtual contact for family and other activities.
- Continued, through Tech Wizards, to provide STEM education and service-learning to help youth learn life and workforce skills, improve academic performance, and aspire to pursue post-secondary education, leading to fulfilling careers and participation in their communities.
- At Greenland Point in Washington County, one of Maine's most impoverished counties, offered hands-on, ecology-focused education, and through scholarships making sure that price is not an obstacle to anyone who wants to come to camp.
- At summer camps and open-air classrooms, Tanglewood and Blueberry Cove offered programs tailored to community needs, including youth development programs for schools seeking to address the learning loss students had faced during the pandemic.



Sustainable Communities and Economic Development

Extension Services on Climate Change Help Guide Planning and Decision Making

Relevance — Climate services—using scientific information to help with decision making—are in increasing demand as climate change increasingly affects society and natural resources.

Response — Extension’s climate services specialist, who also serves as Maine state climatologist, provides climate and weather expertise to stakeholders and the general public. This work encompasses the production and translation of climate information to facilitate decision-making, policy, and planning that ultimately seeks to advance a healthy environment and strong economy in Maine. The climate services program of the Maine Climate Office (MCO) has been designed to meet the climate, weather data, and information needs of Maine stakeholders. These services are delivered via multiple methods, including public presentations and media interviews, contributions to Extension newsletters, service on the Maine Climate Council’s Scientific and Technical Subcommittee, contributions to climate reports and peer-reviewed publications, and by providing climate and weather data via the MCO website.

Results — Services provided through the MCO enhance public and stakeholder knowledge of climate and weather, and inform broader efforts to understand, adapt to, and mitigate climate change in Maine. The MCO website analytics show that since 2021, there have been more than 10,000 page views from 5,700 visitors, and the total number of visitors in Maine is 2,700 across 250 towns and cities.

Increasing Healthy Behaviors Through the Expanded Food and Nutrition Education Program

Relevance — Nationally, in 2020–2021, 17% of youth ages 10–17 were obese. In Maine, 14.6% of youth ages 10–17 were obese. Obesity rates alone do not provide a complete picture of the health of a population. Food insecurity—lack of consistent access to adequate, healthful foods—increases the risk of poor health of Maine’s children in the short and long term. In Maine, one in six children (15.9%) under the age of 18 years are experiencing food insecurity. Of those 39,990 children, 32% of households do not qualify for federal food assistance programs and must rely on charitable organizations for supplemental food.

Response — To help lower childhood obesity rates, UMaine Extension Expanded Food and Nutrition Education Program (EFNEP) delivers education to Maine’s low-income children to improve their knowledge, behaviors, and attitudes related to improving diet quality, increasing daily physical activity, and using food resource management practices to plan and shop for healthy meals and snacks. Program outcomes are measured for all youth ages 5–18 using validated pre/post program surveys.

Results — In fiscal year 2022, 1051 youth participated in Maine EFNEP. Youth participated in an average of seven educational sessions over four months. Eighty-three percent of youth participants completed a pre- and post- survey. As a result of participating in EFNEP:

- 83% of youth improved their ability to choose foods according to current dietary guidelines or improved nutrition knowledge.
- 56% of youth improved their daily physical activity practices.
- 43% of youth used safe food handling practices more often.
- 38% of youth improved their ability to prepare simple, nutritious, affordable food.

The Maine Agricultural Mediation Program Saves Money, Properties, and Relationships

Relevance — The Maine Agricultural Mediation Program (MAMP) partners with Maine organizations, staff at Extension, and the Farm Coaching program to provide facilitated conversations and mediations throughout the agricultural community. The types of problems that farms experience are widely known, yet general knowledge of the program is less so. Major issues include farm succession, farm financing, and workplace issues.

Response — The MAMP, part of the USDA Agricultural Mediation Program, provides alternative dispute resolution through mediation to farmers, their lenders, and others directly affected by the actions of certain USDA agencies; neighbor disputes; and workplace and family disagreements that affect the farm. Mediation is voluntary and confidential, and involves a trained, impartial mediator helping participants to resolve disagreements. In 2022, UMaine Extension hired a full-time professional to coordinate the MAMP, enabling the program to provide direct outreach to more than 25 organizations, provide training as part of a four-session series for service providers, promote the program, and work with others at UMaine to develop a mediation credential.

Results — The Farm Service Agency estimates the typical cost savings for a simple adverse decision case is \$10,000, and as much as \$40,000 can be spent on cases that extend over years. In addition to savings in staff time, savings from the MAMP to producers and/or participants include preservation of assets, properties, and relationships.

Parent Educators Encourage Reading as a Path to Build Language, Literacy, and Socio-emotional Skills in Children

Relevance — Research shows that reading aloud is one of the most important activities parents can do to help a child become a strong reader and set them on the path to success. Reading regularly with young children stimulates optimal patterns of brain development and strengthens parent-child relationships at a critical time in child development, which, in turn, builds language, literacy, and social-emotional skills that last a lifetime.

Response — UMaine Extension parent educators work from two offices covering five counties, and are part of a statewide network of Maine Families Home Visiting Programs. In 2022, 10 certified parent educators provided 1,949 home visits to 239 families living in five counties. Using the parents as teachers model, parent educators met with families in their homes and 1) provided them with current information on child development and parenting, 2) shared activity ideas and ways to engage and nurture their child's optimal development, and 3) provided connections and linkages to community resources. During each home visit parent educators offered book sharing opportunities and information about early literacy, including the importance of reading aloud. Parent educators provided free children's books to all enrolled families, including books in French, Lingala, and Spanish for families who are non-English-speaking. Book sharing was planned for each visit and high-quality children's books were provided each month to all participating families.

Results — Results collected show that 97% of enrolled children had a family member who reported that during a typical week they read, told stories, and/or sang songs with their child every day.

Extension Homemakers Meet Many Community Needs

Relevance — Many communities throughout Maine face poverty, and many families are considered food insecure. Budget cuts and inflation mean that every sector of community living is affected when resources are reduced.

Response — The Maine Extension Homemakers Council has clubs in Androscoggin-Sagadahoc, Aroostook, Cumberland, Franklin, Hancock, Oxford, Somerset, and York Counties. This volunteer group identified community needs and worked to contribute both financial and volunteer hours to community partners to meet the needs of Maine's most vulnerable citizens.

Results — In 2022, the Maine Extension Homemakers raised and donated \$58,994 to civic organizations, nonprofits, and individuals throughout Maine. They also provided 12,449 hours of volunteerism within their counties and communities. In all, their community impact was valued at \$377,140. The fingerprints of the efforts of the Maine Extension Homemakers can be seen in school libraries, at food pantries, in local town offices, with the Newborns in Need program, at the Home for Little Wanderers, at Hope and Justice Project shelters, in the back seats of state police cars, in hospitals and nursing homes, and in assisted living facilities. You will see marks of their volunteerism at animal shelters, at historical societies, and on the faces of people protecting themselves from COVID-19 and the flu. Extension is in our communities, thanks to the Maine Extension Homemakers.

Farm and Ranch Stress Assistance Network (FRSAN) Supports Diverse Farmers

Relevance — Mental health is an often-overlooked challenge farmers face nationwide, and an area that has not been comprehensively addressed in Maine. Farmland loss and land access issues, rising production costs, plummeting farm incomes, climate change, and, most recently, the pandemic are contributing to a mental health crisis within the farming community. Many agricultural service providers lack knowledge and understanding of how to address mental health and wellness for the farm community, how to support those in the food system who are in crisis, and how to practice self-care as they do so.

Response — In the 2018 Farm Bill, the Farm and Ranch Stress Assistance Network (FRSAN) was established to support farmers, ranchers, and other agricultural workers with stress management. FRSAN offers a pathway for improving mental health awareness and access for farmers and their families. In 2021 Extension led a collaboration that received a \$500,000 grant that is being used to serve farmers. We established and manage the Maine FRSAN to support farmers, farmworkers, and agricultural service providers—of land, forest, and sea—with efforts to cultivate wellness and build resilience. New partnerships were formed with organizations, and the work plan was developed by the service providers who were the project participants through small group committees for wellness funds, small grants, mental health, and training. There are more than 250 members in the network.

Results — To date the project has regranted \$182,000 to nine organizations working to represent and support various agricultural producers. Some of the program grants helped pay for infrastructure to increase farm efficiency and reduce farmer stress for Somali Bantu and refugee farmers at the Somali Bantu Community Association and New American farmers at Cultivating Community. The Maine Organic Farmers and Gardeners Association received funding to continue to support a monthly cross-organizational equity space for agricultural service providers. Programs such as Maine Farmland Trust helped to address financial stress within farm business planning via assistantship and grants, while the UMaine Farm Coaching team continues to provide growth and development for farmers. Maine Farm to Institution used their funding to bolster existing farmer program workshops with training and materials focused on farmers accessing institutional markets.

More than \$100,000 was regranted to organizations directly serving farmers of color or indigenous land stewards. Forty farmers directly benefited through \$500 stipends for mental health and wellness activities. Educational outreach was provided in English, Spanish, and Haitian Creole. Mental health counseling was provided for farmers, and functional training assessments were provided to prevent injury, subsequent productivity loss, or long-term disability. Ten thousand dollars was allocated for the emergent need presented by possible PFAS contamination in soil and water on farms, and these funds were used to support testing.

This project is making a large impact on the conversation around mental health in agriculture. Partners from local organizations are counseling farmers who are stressed, providing infrastructure that increases the ability of farmers to reach their customers, and providing tools for land tenders to serve and honor traditional ways of growing in their communities. By strengthening the capacity of organizations, and building relationships and a service provider network focusing on farmer resilience and stress reduction, we are supporting a cultural shift to assist and meet the unique mental health needs of those who work in Maine agriculture.

Micro-credentialing through UMaine System Builds Workforce Competence and Confidence

Relevance — Extension provides valuable skills to both youth and adult learners. There is a need to provide employer-recognized evidence of trainings and skills for agricultural and other workers.

Response — In 2020 we began developing and issuing micro-credentials through the UMaine System. In 2022, these included micro-credentials and badges in Meat Cutting, Horticulture Apprenticeship, Seafood HACCP (hazard analysis and critical control points), Meat and Poultry HACCP, Food Processing Sanitation, Food Safety Systems, and Facilitation.

Youth in the 4-H Communication Science program are now eligible to receive the nationally normed and recognized "Oral Communication" badge from the Education Design Lab.

There is interest from additional Extension faculty, staff, and partners, and future possible Extension micro-credentials include those in farming and agricultural skills, volunteer management, and the Master Gardener program. A full youth-to-adult pathway in aquaculture is under development and should be completed in early 2023.

Results — Earners ranged from current UMaine System students to adults in the general public. These credentials can be used to showcase skills earned through the University of Maine Cooperative Extension and are verified by the University of Maine System. Micro-credentials help earners make competencies visible, beyond what is seen on a transcript or resume; demonstrate skills in real-world settings; gain work experience and receive valuable performance feedback; stand out to employers; better articulate the skills developed to potential employers; enhance digital identity; share badges; and be recognized. All micro-credentials/badges can be shared on social media and professional sites, such as LinkedIn and the holder's personal website, e-portfolio, or resume.

Diagnostic and Research Laboratories Apply New Technologies and Cross-Disciplinary

Relevance — The COVID-19 pandemic provided a stunning demonstration of the degree to which so many aspects of our lives are now intertwined. Wildlife health affects farm animal health affects human health. Every part of our economy was affected by the pandemic, vividly illustrating the importance of growing our understanding of today's many agricultural threats and how to control them.

Response — The University of Maine Cooperative Extension Diagnostic and Research Laboratory occupies a 28,000-square-foot commercial laboratory building located a few miles from campus. It houses our Veterinary Diagnostic Lab, Aquatic Animal Health Lab, Arthropod Lab, and Plant Disease Diagnostic Laboratory. This facility is the most bio-secure location within the University of Maine System. Opened in 2018, the lab brings together scientists researching animals, agriculture, insects, and plants under one roof. The unique combination of researchers provides many teaching opportunities for students, as well as premier research and outreach facilities.

Results — By allowing for research contributions to agriculture, public health, communities, and wildlife, the lab benefits Maine in a variety of ways, including protecting the natural resource- and food-based economies, adding to food safety and human health, and providing unique diagnostic and testing services to farmers, homeowners, and the public.

Maine Food and Agriculture Center Is Helping to Grow the State's Economy

Relevance — With \$5 billion in overall annual economic impact, agriculture, commercial fishing, and food processing are some of Maine's largest, fastest growing, and most promising industries. UMaine Extension's research and outreach programs seek to move these industries forward through cross-disciplinary collaboration that identifies lasting solutions to issues that inhibit them.

Response — The Maine Food and Agriculture Center (MFAC) is a partnership of Extension and the Maine Agricultural and Forestry Experiment Station. The center uses the 16-county reach of Extension, and many of Extension's recommendations to the state's agricultural community come directly from research conducted at Experiment Station farms. This research-extension partnership has been working for more than 100 years and is as vital today as it was early in the twentieth century.

Results — MFAC is growing to encompass all sectors of the burgeoning food economy, establish first-contact access to the programs and expertise available at all seven of Maine's public universities, and create opportunities for cross-campus and cross-discipline coordination and program development based on emerging needs in Maine's food economy.

FINANCIAL SUPPORT

University of Maine Cooperative Extension Support for Cumberland County

Without statewide support, UMaine Extension would not be present in your county. Funds for projects are provided through the University of Maine, Federal Formula Funds, grants, contracts, and fees. Dollars from other sources support salaries and benefits for Extension specialists, county educators, Extension administration, computer equipment and networking, publications, postage, telephone, and travel.

Statewide Extension Funding

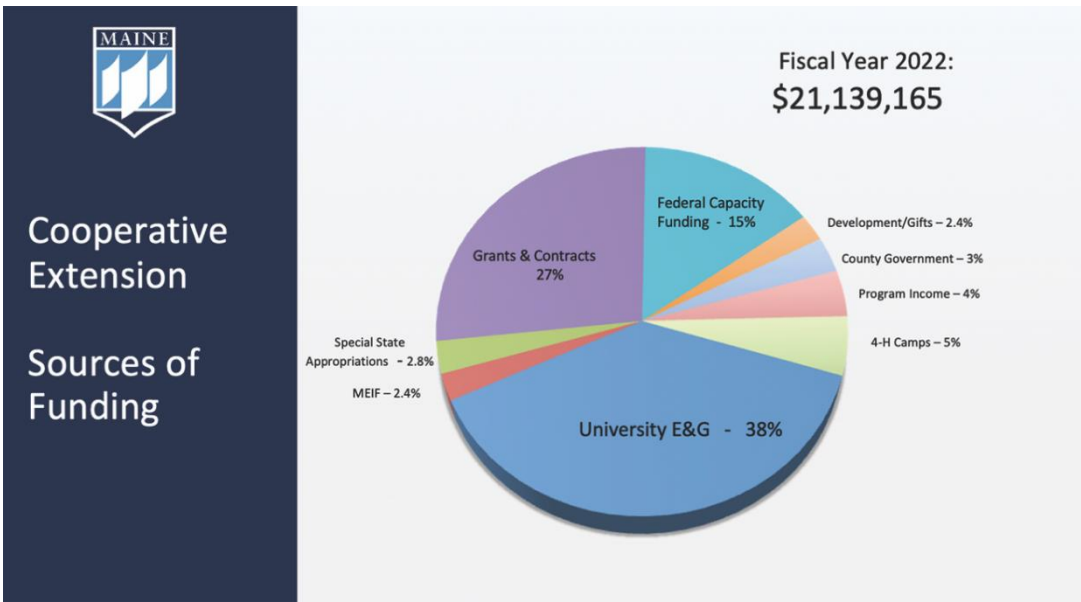
As a unique partnership among federal, state and county governments, UMaine Extension uses funding from Maine counties and the University to match and leverage support from the United States Department of Agriculture, other federal grantors, state agencies and private foundations. Each county UMaine Extension office is also part of a statewide organization and the national Extension system.

This pie graph illustrates the financial resources for programs offered, supported and managed out of the Cumberland County office. Each year, Cumberland county tax dollars support the UMaine extension with physical office space, support staff salaries, office supplies, equipment and some programming expenses.

Cumberland County	2022
Local Salaries and Benefits	\$824,162
Prorated Support from UMaine*	\$577,300
Computer Equipment and Networking	\$4,425
Statewide Animal Diagnostic Lab	\$18,929
Marketing, Publications, Video	\$769
Local Programming Supplies & Expenses	\$44,548
Postage	\$1,443
Annual Building Support	\$17,327
Telephone	\$6,665
Travel	\$32,135
TOTAL	\$1,527,704

* Prorated support from UMaine reflects travel, postage, telephone, computer equipment & networking, salaries & benefits for administrative and state-wide staff.

Statewide Funding Levels by Source - 2022



COUNTY HIGHLIGHTS —

4-H Youth Development

Program Overview



Leveraging the talents of volunteers, staff, parents, teens, and the community so that youth will thrive.

Staff

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Producing Future Scientists & Engineers



- Cumberland County 4-H enrolled 134 youth in 4-H Animal Science projects; 104 youth showed or sold their animals at the Cumberland Fair earning more than \$50,000 in sales at an auction.
- 312 grade school youth completed the eDNA 4-H Project in the Summer of Science.
- STEM Ambassadors from local colleges engaged 24 Cumberland County youth.
- Virtual Learning Programs through UMaine 4-H reached 22 Cumberland County youth.

Educating Youth to be Healthy and Well



- 201 4-H club members met regularly with caring adult volunteers to work on projects ranging from fashion revue to livestock husbandry to leadership to robotics.
- Seven Cumberland County 4-H Youth attend the 2022 Healthy Living Summit in Washington, D.C.
- 12 teens, sponsored by Portland Public Schools, completed a Health Careers Internship in the summer of 2022.
- 66 Cumberland County youth were in the Learning Ecosystems Northeast program in Gorham and Westbrook to learn how to mitigate the effects of climate change in Maine.
- 25 Sheep Club members prepared extraordinary meals as part of the 2022 Lamb Cookoff Challenge.

Producing Future Leaders



- Cumberland County 4-H recruited and trained four college interns and 13 Teen Teachers who then provided 156 hours of teaching for 312 grade school youth about emerging genetic technologies (eDNA).
- 4-H volunteers and staff trained and mentored 32 youth to be club officers, six teen council members, three true leaders in equity, and 66 climate change leaders.
- Twenty-six 4-H teens were selected to attend six national 4-H conferences in 2022 in Washington, D.C and Atlanta.

Fostering Access, Equity, and Belonging



- Cumberland County 4-H hosted UMaine 4-H in the Portland Pride Parade. Sixty-seven youth and adults marched in the parade or helped plan the 4-H Pride event.
- Interpreting and translation services were provided for fourteen youth in French, Portuguese, Spanish, and Lingala.
- Three teen leaders were selected to attend the True Leaders in Equity training in Washington, DC; those teens planned (and are planning) low-cost soccer clinics.



Engaging Volunteers



- 62 certified 4-H volunteers were involved with projects and provided over 4,202 hours of service. 4-H volunteers' projects included serving as club leaders, volunteering at countywide events, and serving on volunteer committees. The volunteer service provided is valued at \$125,850.
- 112 adults provided short term mentoring and teaching; including Cumberland County librarians, after-school providers, teachers, and parents. Other adults helped with the fair, Summer of Science, transportation, or fundraising.

Collaborating Agencies & Program Partners

National 4-H Access, Equity, and Belonging Committee, Baxter Memorial Library, Boys and Girls Club of Greater Portland, Children, Youth, and Families At-Risk Program, Cumberland Farmers Club, Gorham Bee Club, Gulf of Maine Research Institute, Intercultural Center of Westbrook, Master Food Preserver Program, National 4-H Council, New Gloucester Library, Portland Connect Ed, Portland Public Library, Portland Public Schools, Portland Out of School Time Network, Portland Public Housing Authority, Portland STEM Expo, Raymond Village Library, Tidewater Gardens, Tractor Supply Company, UMaine Department of Physics and Astronomy, UMaine EPSCoR Program, University of Southern Maine, and YMCA of Greater Portland.

COUNTY HIGHLIGHTS —

Agriculture

Staff

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Program Overview

The Sustainable Agriculture program develops and delivers educational programming and resource for the agricultural community of Cumberland, York, Androscoggin and Sagadahoc Counties. These resources serve to increase farm economic viability, safety, and environmental and community sustainability.

- Assist farmers with climate change adaptation planning and practice adoption. This includes soil health and cover cropping research, irrigation demonstrations, soil moisture management demos, and farmer demonstrations and collaborations on all of those practices.
- Develop and distribute bi-weekly farming newsletters to over 3,000 recipients. Topics included financial assistance opportunities, general farm safety, soil health topics, and upcoming events.
- Design and deliver educational programming to support the maple industry in Maine with quality control, business management, and forest sustainability topics.
- Supported 15 beginning and prospective farmers to understand the realities of farming, access resources to help launch farm businesses, and to connect with various service provider specialists to support all aspects of their production and business goals.
- Farm and tractor safety training was offered for 85 farm workers, farm owners, and homeowner tractor owners. One of these offerings (26 participants) was an in depth training, recognized by the U.S. Department of Labor that certifies 14- and 15-year-old youth to operate equipment on farms.
- Direct support for farmers through farm visits, and communications. We visited 49 farms to troubleshoot concerns and connect them with resources.

Soil Health Research and Farmer Collaborations

A survey conducted by our program revealed that 78% of farmer respondents leave some aspect of their farm soils exposed and prone to erosion over winter. The unanimous cause of this is due to late season crops being harvested too late to plant a cover crop to protect the soils. Our team received funding from the Sustainable Agriculture Research and Education (SARE) program to investigate the potential to seed cover crops over standing cash crops for the purpose of establishing living soil coverage, going into the winter. In addition to research farm trials, our team has recruited four Southern Maine vegetable farmers to trial and demonstrate this practice. In year one of this trial (2022) we have learned about the practical and logistical considerations of this practice, in addition to the effects of this practice on soil moisture, and crop growth.

In year two of the project, more farmers are enrolled to trial the practice. Year one farmer collaborators have expressed great interest in continuing this practice, therefore protecting their soils and surrounding waterways in the winter and spring seasons.



Workshops, Field Days, and Outreach

- Organized a 5-part workshop series for 68 cut flower farmers on marketing and sales, social sustainability, and production topics.
- Hosted a 5-part virtual series on winter care of livestock.
- Supported the Maple Industry throughout Cumberland County and Maine, to support beginning producers to get established and meet food safety standards. This included a workshop and hands-on class with the Portland Arts and Technical High School (PATHS) to set up maple tubing for enhancing their maple sap collection.

Collaborating Agencies & Program

Cumberland County Beekeepers Association; Maine Department of Agriculture, Conservation & Forestry; Maine Department of Economic and Community Development; Maine Farm Bureau, Maine Maple Producers Association; Maine Organic Farmers & Gardeners Association; Maine Small Fruit and Vegetable Growers Association; MB Tractor and Equipment (Gorham); New York Center for Agriculture Medicine & Health; Northeast Cover Crop Council; Northeast SARE; Pennsylvania State University; Portland Arts and Technology High School; Portland Food Council; Southern Maine Maple Sugarmakers Association; Town of Gorham; USDA Farm Services Agency; and USDA Natural Resources Conservation Service.

COUNTY HIGHLIGHTS —

Horticulture

Staff

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Every day, Maine gardeners are deciding on whether and how to manage pests, what fertilizers to use and how much, what plants to grow, which methods to use to cultivate the soil, and how to utilize water resources to maintain landscapes. Nearly every residential site has a landscape that requires maintenance and decisions made in these sites can have a significant impact on our natural resources. Home gardener success also results in improved food security and has an economic role in our green industry.

In Cumberland County, the Home Horticulture program administers the University of Maine Gardens at Tidewater Farm, Maine Harvest for Hunger program, and Master Gardener Volunteers program. Our education programs help gardeners learn about sustainable gardening practices and to troubleshoot issues in their gardens. In addition, our program advises schools, community gardens, and businesses with best management practices for their gardening projects.

UMaine Gardens at Tidewater Farm

The Gardens at Tidewater Farm provide agricultural and horticultural education as it relates to sustainable food production and ecologically compatible landscapes, while creating a community for gardeners of all ages and skill levels.

- We continue to collaborate with the Horticulture program at Southern Maine Community College:
 - Students grew the plants for our All America Selections Display garden (an independent plant trialing and award program).
 - We hosted a few classes during the summer and fall semester.
- We hosted 12 programs and events, including the Master Gardener Plant Sale, garden tours, workshops, and field trips.
- We grew over 1,500 pounds of produce for local food pantries and programs in Cumberland County.



Program Overview

- Improved food security through production, donation, and/or gleaning of garden and farm produce, by increasing the number of home gardeners, Master Gardener Volunteers, and local businesses growing and donating for the Maine Harvest for Hunger program (over 12,000 pounds of fresh produce was donated in Cumberland County).
- Organized nine gardening webinars, covering a wide range of seasonal topics, for 150 Cumberland County residents and 1,396 statewide and out-of-state residents.
- Trained 21 new Master Gardener Volunteers in Cumberland County using Brightspace, a learning management system (LMS) used by the University of Maine System.
- Launched two new online training programs, the Maine Gardener Training and the Maine Horticulture Apprentice Training, to meet the needs of home and professional gardeners.
 - In total, we had 38 participants in the Maine Gardener Training with 102 participants statewide, and eight participants in the Maine Horticulture Apprentice Training with 38 participants statewide.
 - We partnered with the Portland Arts and Technology High School (PATHS) to offer the Maine Horticulture Apprentice Training to six of their horticulture students.

- Developed educational content, including videos and factsheets, for our online training programs.
- Provided support to 200 trained Master Gardener Volunteers in Cumberland County.
- Distributed 400 seed packets and 800 seedlings to 160 residents across six Portland Housing Authority sites.
- Provided information and assistance regarding sustainable gardening practices, soil testing information, pest and plant identification, and more to over 450 residents in Cumberland County.

The Value of Volunteers

Two hundred Master Gardener Volunteers were involved with 45 projects and provided about 7,653 hours of service to the community. Projects included Maine Harvest for Hunger, creating educational resources, writing articles, leading workshops, and much more. The volunteer service provided is valued at \$229,207.35.

Our volunteers are the “extension of Extension,” and play a vital role in outreach and education for Cumberland County. The following is just one example of the positive impact of our Master Gardener Volunteer program:



“It is not unusual to receive recognition and thanks for the work we do in the gardens at the Ronald McDonald House, but every once in a while we are graced with the reason we volunteer our time and work so hard. Last week I was approached by the grandmother of an infant who is in NICU. Her story about her beloved 6-month-old grandson was so sad and her gratefulness for quiet reflective time in the garden so poignant. She shared that every evening after a long day in the hospital she and her husband sit in the garden and it is the only place that brings them comfort while so far from home. She was so thankful for the little sanctuary we have created.”

-Robin Babino, Cumberland MGV Class of 2012

Collaborating Agencies & Program Partners

Adult education programs, Camp Sunshine, Casco Bay Dialysis Center, Center for Grieving Children, Cumberland County Food Security Council, Cumberland County Beekeepers Association, University of New Hampshire Extension, Cultivating Community, Girl Scouts of Maine, local farms and orchards, local garden clubs and land trusts, local libraries and businesses, local nurseries and greenhouses, Maine Organic Farmers and Gardeners Association (MOFGA), Maine Audubon, Maine Department of Agriculture (Maine Board of Pesticides Control, Animal & Plant Health, Horticulture Program), Maine Forest Service, Maine Landscape and Nursery Association, News Center Maine, Portland Housing Authority, Ronald McDonald House, Southern Maine Community College Department of Horticulture, town, school, and community gardens, Maine Health, and Wayside Food Pantry.

COUNTY HIGHLIGHTS —

Food & Nutrition

Staff

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Program Overview

Over the past decade, interest and demand for local food and food preservation has continued to grow, due in part to economics and the public's interest to support a local food system. UMaine Extension efforts seek to create a social shift towards a more educated and skilled public that will revitalize our local food system and positively impact the local agricultural economy through an increase in safely preserving local Maine foods at home to eat year round. As the “go-to” resource for food preservation, food safety, and nutrition education, UMaine Extension has responded to meet the needs of the public.



Home Food Preservation Education

Staff and Master Food Preserver volunteers delivered in-person food preservation workshops and events in nine Maine counties. This programming reached nearly 2,000 people throughout the state at food festivals, farmers markets, adult education facilities, libraries, farms, and agricultural fairs.

UMaine Extension continued delivery of food preservation education via webinar format to meet the needs of veteran (35%), intermediate (18%), and beginner (47%) home food preservers. Webinar topics coincided with the Maine growing climate and featured a demonstration of the food preservation topic, pre-recorded instructional videos, and a Q & A session. Over 1,000 people, representing each county in Maine, 28 states, and seven countries, attended at least one of the six Preserving the Maine Harvest webinars offered.

Food Safety Training for Volunteers and Workforce and Development

Maine is well-known for our unique food scene. Communities rely on both volunteers and food industry employees to provide safe foods to prevent foodborne illnesses. UMaine Extension provides food safety training to reach both of these audiences. Cooking for Crowds provides food safety training for volunteers who support food events within the community - church suppers, soup kitchens and community meals. ServSafe® Certified Food Protection Manager courses and exams are available to build a skilled and knowledgeable workforce to support Maine's robust food economy.

New Maine initiative to build ag literacy through immersive CTE culinary arts programs

Maine's Building Agriculture Literacy Through an Immersive Culinary Experience project, which received a \$300,000, four-year grant, is led by Kathy Savoie, University of Maine Cooperative Extension educator and professor. CTE culinary arts instructors will receive professional development experiences to increase their agricultural literacy and enhance the connectedness between agriculture and food service in their culinary arts curricula.

A goal of the project is to help create a skilled, educated workforce that will increase the use of Maine grown, processed and produced foods in their programs and careers by changing the way students — tomorrow's food professionals — think about the importance and value of local food.

UMaine Cooperative Extension, UMaine Food Pilot Plant and Maine Agriculture in the Classroom will collaborate to provide experiential learning opportunities for CTE culinary arts instructors through a week-long Immersive Culinary Arts Summer Institute.

Additionally, Culinary Arts Instructors will be eligible to receive mini-grants to support nontraditional learning experiences to increase students' understanding of local food systems. In addition, the UMaine Food Pilot Plant will host local food competitions for CTE culinary arts students, challenging them to use Maine foods in creative and innovative ways to meet the demands of today's consumers.

Expanded Food and Nutrition Education Program

The Expanded Food and Nutrition Education Program (EFNEP) provides limited-income youth and families with interactive education in homes, community groups, in schools, and through remote education. For FY2022, Brenda Bracy (EFNEP) CEA in Cumberland County) provided programming to Canal Elementary School, Bonny Eagle Middle School, Crossroads for Women, and FED-CAP (South Portland).

Annual behavior change data for FY22 in Cumberland County confirms that of the 81 adult graduates (representing 107 family members), 94% improved their diet, 86% improved food resource management practices, 60% improved food safety practices and 47% improved physical activity behaviors. Of the 149 youth reached, 70% graduated from the program, 62% of youth improved physical activity practices, 83% improved their nutrition knowledge and 54% improved food safety practices.

* Webneers FY2022 Adult & Youth Summary Reports for Cumberland County

Collaborating Agencies and Program Partners

USDA National Agriculture Library, Local Housing Authorities, Crossroads for Women, public schools, public libraries, FED-CAP adult classes, local food pantries, local farmers markets, adult education facilities, partners of Good Shepherd Food Bank, Cumberland County Food Security Council, and Maine Nutrition Council.

The County Extension Act

The County Extension Act explains the role of county government in funding local Extension offices.

Cooperative Extension work shall consist of the giving of practical demonstrations in agriculture and natural resources, youth development, and home economics and community life and imparting information on those subjects through field demonstrations, publications and otherwise. For the purpose of carrying out this chapter, there may be created in each county or combination of two counties within the State an organization known as a “county extension association,” and its services available to all residents of a county. The county extension is viewed as a unique and important educational program of county government. The executive committee of each county extension association shall prepare an annual budget as requested, showing in detail its estimate of the amount of money to be expended under this chapter within the county or counties for the fiscal year. The executive committee shall submit to the board of county commissioners on a date requested by the county commissioners, and the county commissioners may, if they deem it justifiable, adopt an appropriate budget for the county extension program and levy a tax therefore. The amount thus raised by direct taxation within any county or combination of counties for the purposes of this chapter shall be used for the salaries of clerks, provision of office space, supplies, equipment, postage, telephone, a contribution toward the salaries of county educators and such other expenses as necessary to maintain an effective county extension program.¹

¹Excerpted from Title 7, Chapter 7 of the Maine Revised Statutes, §191–§195.

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