

## Annual Report for 2018-2019

### EXECUTIVE SUMMARY

#### Major Accomplishments

***New Dean of Extension:*** After a successful national search, we welcomed Dr. Hannah Carter as the new dean of University of Maine Cooperative Extension. The transition of leadership within Extension brings exciting new ideas and opportunities.

***Assistant Extension Professor and Ornamental Horticulture Specialist:*** After a successful national search, we welcomed Dr. Matthew Wallhead to Extension as an Ornamental Horticulture Specialist and Assistant Professor of Horticulture, with a joint appointment with the School of Food & Agriculture.

***Lafayette and Rawcliffe 4-H Center:*** With significant fundraising support from the Maine 4-H Foundation, this new 4-H science center in Orono will house a variety of youth development programs, letting youth connect with UMaine researchers near and far. The center opened in June 2018.

***University of Maine Cooperative Extension Diagnostic and Research Laboratory:*** A large investment in infrastructure and programming was realized in June 2018 with the opening of Extension's Diagnostic and Research Laboratory. The DRL is a premier research and outreach facility that brings together scientists researching animals, agriculture, insects, and plants under one roof. 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. The DRL also is home to UMaine's Aquaculture Research Institute that provides leadership in aquaculture research and development.

***Maine 4-H Programs:*** Last year over 17,700 youth participated in Maine 4-H by attending camps and learning centers, community clubs, school, after school, and special interest programs. Extension reached more underserved and underrepresented youth than ever before. Our faculty, staff, and over 1,500 volunteers provided positive learning experiences for Maine youth.

***4-H Camp and Learning Center at Greenland Point:*** The Greenland Point 4-H Center was purchased by the Maine 4-H Foundation and is now offering Extension programs in Washington County. There are now four 4-H centers across the state: Bryant Pond, Tanglewood, Blueberry Cove, and Greenland Point. Last year, these Camps served over 8,000 youth with programs in STEM, environmental education, and civic engagement. Our school outreach programs use the outdoors and experiential education to teach students traditional classroom subjects.

***EFNEP's 50th Anniversary:*** Extension's Expanded Food and Nutrition Education Program (EFNEP) is celebrating 50 years of success in 2019. EFNEP is the nation's first federal nutrition education program, and was created to help limited-resource families acquire knowledge, skills, attitude and changed behavior necessary for nutritional well-being of the total family. In 2018, over 2,500 youth and 579 adults participated in Maine EFNEP, with the program reaching an additional 1,653 individuals in adult participants' families.



#### Highlights

***UMaine Extension*** is the largest public service entity within the University of Maine System. Extension employees and volunteers reach more Maine people annually than there are enrolled students within the UMS. Extension reaches over 5,600 businesses annually with almost all in the food-based economy. The work of Extension is constituent driven and research based, and a special emphasis is made to reach new and underserved audiences. Extension reaches many of the most diverse people in Maine. We make special effort to serve the handicapped, racial minorities including Native Americans, and new immigrant communities.

***Extension Faculty and Staff*** provide trustworthy researched-based resources to Maine people on issues that are important to them. We have existed within local communities for over a century and have earned the respect and trust of those we work with. This value is reflected in the reality that every county government in Maine has contributed to its local Extension Office for over 105 consecutive years. UMaine has the largest Extension

program in New England. Our workforce develops many positive relationships and has a low turnover rate resulting in long-term partnerships and collaborations. Extension faculty and staff are employed by UMaine, but they work for, and with, the people of Maine. This commitment transforms the University *of* Maine to the University *for* Maine in every community across the state.

**Volunteers** are the heart of Extension, giving their valuable time, effort, and expertise to greatly magnify the value of our work to the people of Maine. All of our volunteers commit time to appropriate training prior to their service. This year over 5,000 Maine people volunteered more than 92,000 hours with us in a myriad of ways from 4-H clubs to fundraising, and from growing food to managing County budgets. This remarkable effort equates to over 45 full-time staff members.

**Online Presence:** In 2018, UMaine Extension's website at extension.umaine.edu – a composite of 60+ interconnected websites – received over 2 million pageviews, nearly 40 percent of which were from Maine. Nearly 24,000 people followed or were subscribed to UMaine Extension's 53 county and program-specific social media accounts on Facebook, Twitter, YouTube, Pinterest, and Instagram. More than 175 educational videos were available to visitors on our YouTube and Kaltura channels; many were also embedded in our web pages. Our YouTube videos received 5,900 views and nearly 12,000 watch-time minutes. UMaine Extension instructional videos have been viewed more than 4 million times.

## I. SERVING MAINE

### A. Community Engagement

**Maine AgrAbility:** Maine AgrAbility helps farmers, loggers, and fishermen facing physical or cognitive challenges to enhance their ability to farm and live independently. AgrAbility specialists assess issues and offer adaptive recommendations. They provide education about safe work methods and connect people with other resources. Since 2010, Maine AgrAbility has provided technical information to 754 farmers and conducted on-site assessments for 92 agricultural workers in areas including dairy and livestock operations, Christmas tree farms, fruit orchards, agritourism, vegetable and maple syrup production, hay sales, managing woodlots and lobstering. Clients report increased knowledge of their conditions and increased accessibility for their daily work.

**Master Gardener Volunteers:** Extension faculty and staff trained 87 new MG Volunteers, bringing our statewide active MG Volunteer corps to 910. In total, they donated over 28,000 hours to a variety of educational efforts, and involved 796 youth in horticulture. Since 2000, the affiliated Maine Harvest for Hunger program has distributed over 2.9 million lbs. of food to citizens grappling with hunger. In 2018, donations of 231,752 lbs. of fresh produce from over 100 Maine farms went to 187 hunger alleviation distribution sites. A corps of 512 volunteers logged 2,664 hours and the value of the produce was over \$391,660.

**Community Engagement Academy:** Stakeholder engagement in community planning is a challenge for Maine and NH municipalities. The Community Engagement Academy is an innovative partnership of UMaine Cooperative Extension, Maine Sea Grant, UNH Cooperative Extension, and the UNH Office of Engagement and Academic Outreach. In 2018, the partnership offered a 3-day Community Engagement Academy in 3 NH and Maine communities. Designed for practitioners and community volunteers, the 2018 Academy occurred in communities in different stages of downtown revitalization, and provided best practices for community engagement.

**Telstar Freshmen Academy:** 2018 marked the 4th full year of Telstar Freshman Academy, an experiential program designed to engage students, and build communities of learning, resilience and high aspiration for the high school years. TFA students test scores are above the national average and show improvements in aspiration toward college and careers. Parents of students report dramatic, positive changes in their children's behavior, including improvements in self-confidence, impulse control, speaking, writing, and problem-solving abilities.

**Tech Wizards:** Extension's Tech Wizards program matched 120 students with community mentors and local schools. Students participated in ongoing fieldwork, citizen science initiatives, and service learning. They were empowered to engage with their communities, contribute their time and skills to address important scientific questions, and to recognize environmental stewardship as an overarching life ethic.

**4-H Community Central:** This program addresses the increased vulnerability that children in public housing experience due to their environment. The program places Extension staff in public housing sites in Portland and Lewiston, where they engage youth with their parents, elders, school, and community through hands-on 4-H projects in science, leadership, and citizenship. In four years, the program has involved over 7,900 school-age participants. In their local communities, youth in grades 3-8 received over 780 hours of 4-H STEM programming taught by teen mentors and community leaders. Ninety-six teens (82% of color), in grades 9-12 dedicated over 440 hours of mentoring and leadership to young people in their communities. Participating youth have demonstrated knowledge, skills, attitudes, and behaviors necessary for fulfilling, contributing lives.

**Parent Education:** The first three years of a child's life are critical for growth and development. Research demonstrates that the experiences a child has during this time affect the developing brain, and lay the foundation for future well-being. With federal, state, and local funding, certified home visitors made 1,947 visits to 189 families. Using the evidenced-based Parents as Teachers model, home visitors met with families in their homes to share activity ideas to support child development, and build parenting skills and links to community resources.

## **B. Economic Development**

**Potato Industry:** The Maine potato industry encompasses over 500 businesses employing over 2,600 people and providing over \$112 million in income to Maine farm families. The economic impact from our pest monitoring and educational programs for the 2018 season is estimated to be more than \$8 million.

**Blueberry Industry:** Maine's wild blueberry industry, with 485 growers on 17,000 acres harvested, produced 57 million pounds of wild blueberries in 2018. Due to a highly competitive market, prices to growers are down in the past seven years, making support from UMaine more valuable than ever. Extension and research efforts improved crop productively and efficiency by addressing pollinator population enhancement, weeds, pest insects, and diseases. The research-based knowledge we provide to Maine growers has enabled them to remain competitive in the world marketplace, and to continue to contribute significantly to the State's economy.

**Maple Industry:** Maine has the third largest maple production in the United States, behind Vermont and New York. Our maple industry has an annual statewide economic contribution of \$48 million in output, 805 full and part time jobs, and over \$25 million in labor income. Extension's leadership in an annual International Maple Syrup Institute Maple (IMSI) Grading School supports this important, internationally recognized industry.

**Beginning Farmer Resource Network of Maine:** In 2012, Extension used a SARE professional development grant to focus on increasing the ability of individual agricultural service providers (ASPs) to meet the needs of new and beginning farmers. This sparked the formation of the Beginning Farmer Resource Network of Maine (BFRN), a coalition of Maine agriculture agencies and organizations working together to connect aspiring and beginning farmers to resources for farm business success. In 2018, an impact survey showed that as a result of BFRN, over 800 farmers made changes affecting about 40,750 acres and 47,265 animals, and resulting in a total value over 5 years of more than \$8 million.

**University of Maine Animal Health Lab:** The UMAHL provides services to the Maine veterinarians, livestock producers, and animal owners. The lab performs a variety of diagnostic services, including necropsy, microbiology, virology, pathology, and special research support. It offers diagnostic support to clinicians, and assists in finding solutions for agricultural and aquacultural producers using Extension resources. The new Diagnostic and Research Laboratory that opened in June 2018 has expanded UMAHL's services, reach, and positive impact on Maine's over 8,000 farms.

**A Safe Food System:** Extension provides food safety training programs such as food preservation, Cooking for Crowds, Industrial Food Sanitation, Good Agricultural Practices, Hazard Analysis Critical Control Points certification, and Food Safety Modernization Act trainings. Faculty also engage in individual food safety consulting and process authority food product reviews for new and existing companies statewide. These programs directly reach and train over 10,000 Maine people annually. In 2018, the food process authority lab reviewed over 500 products, leading to added income and jobs in both Maine and NH. In most cases, one-on-one food safety consulting led to increased revenue, retention of jobs, and/or increased hiring.

**Profitability of Rural Entrepreneurs:** Research shows that helping rural entrepreneurs improve their business skills will improve their chances for success. One of the most important business management skills is pricing, yet many small business owners lack the knowledge and skills necessary to develop a profitable pricing strategy. In 2018, UMaine Extension conducted pricing workshops across the state, presented a pricing webinar in collaboration with the Maine Food Strategy, and taught a pricing at a statewide conference for entrepreneurs.

**Access to Capital in Local Communities:** Extension supports improved access to financing for Maine business through its collaboration with a regional economic development agency that provides SBA loan guarantees for prospective borrowers. As an active member of the Loan Review Committee, Extension provides guidance and oversight on credit and lending strategies, reviews loan applications and along with other business and community leaders arrives at a loan recommendation. In 2018, the Loan review Committee approved 40 loans of over \$3 million to 27 businesses. Over \$7 million was leveraged bringing total investment to over \$10 million. One hundred-fifty-one jobs were created or retained, and the program benefited 7 of Maine's 16 counties.

## C. Workforce Development

**Early College:** In 2018, the University of Maine System funded the *Pathways* Early College program at UMaine's Bryant Pond 4-H Center. This is a new initiative that will provide dual enrollment opportunities for high school juniors and seniors in Oxford County, with recruitment targeting first generation college students. The program's goal is to increase the number of students matriculating to UMS campuses, and to increase retention rates, especially among first generation college students.

**Aquaculture Industry Workforce:** In 2018 and 2019, Extension partnered with the UMaine Center for Inclusion and Disability Studies and UMaine Center for Cooperative Aquaculture Research (CCAR) to deliver a six-week, paid Aquaponics Internship Program for high school students with disabilities. Located on the CCAR campus, this workforce development project was designed to give youth an opportunity to develop skills relevant to the aquaculture industry and cultivate career awareness.

**So You Want to Farm in Maine:** Since 2011, UMaine Extension has provided diverse educational outreach through its "So You Want to Farm in Maine" series to enhance the skills, business management knowledge, confidence of new and established farmers. Extension programs are live, live-streamed and archived, and have reached over 800 participants from all Maine counties and out-of-state. Topics include agriculture enterprise selection, business planning, record keeping, market research, regulations, and resource identification. A survey sample of participating farmers (n=158) revealed 88 new jobs, with estimated wages of \$612,000 annually, and an estimated total market value of agricultural products sold by these farms of over \$2.2 million annually. Since 2017, when the training qualified as FSA borrower training, farmers with FSA loans have been able to complete their loan requirements and have received over \$2.4 million in farm loans.

**Farm Tractor Safety:** Extension has presented Farm Tractor Safety courses for an average of 80 individuals per year for over 25 years. In 2018, we provided farm safety training to 294 youth and farmers, including 167 in tractor safety. To support this programming, Extension collaborated with legislators, Maine Farm Bureau, the New York Center for Agricultural Health and Medicine, tractor dealerships, and local farms. In 2018, 70 individuals completed the 5-week, 20-hour, National Safe Tractor and Machinery Operation Program curriculum. Forty-nine people took the abridged Tractor Safety Short Course.

**Pesticide Education Credits:** Extension faculty and staff provide a variety of education options that earn education credits towards certification for growers in Maine who annually sell more than \$1,000 of plants or plant products intended for human consumption and who use commercial or general-use pesticides on property owned or leased by them. The Board of Pesticides Control estimates that this enables more than 2,000 growers to safely interact with the full spectrum of agricultural treatments.

## D. One University Initiatives

**Maine Food and Agriculture Center:** With \$3.9 billion in overall economic impact, agriculture is one of Maine's largest, fastest growing and most promising industries. The Maine Food and Agriculture Center 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 explore opportunities for cross-campus and cross-discipline coordination and program development based on emerging needs in Maine's food economy.

**4-H STEM Ambassadors:** Ambassadors are students at UMaine System campuses who are trained in experiential learning and science content, and are then paired with host sites to facilitate STEM activities with youth. All seven University campuses have partnered to bring hands-on STEM education to young people in their community. In 2018, the program reached over 1,000 youth at 66 community sites, including schools and afterschool partners. Extension trained 120 college students in the development and delivery of informal STEM-based educational experiences, and these Ambassadors committed 2,100 hours of time to the program.

**"One University" Student Workers:** We regularly reach out and hire undergraduate students from other UMaine campuses in support of our programs. For example, Extension has hired University of Southern Maine and UMaine Machias students to support 4-H Science initiatives and to support statewide nutrition and food safety programs. We have received positive comments from the students who appreciate the opportunity to actively participate in real life activities while building their portfolio of experience.

**Multi-campus Program Integration:** Over the past year we have held at UMM and USM 4-H programs integrated with local staff and students, giving youth realistic college campus experience. Programs included a Robotics Expo and Mini-Forum both of which will reoccur in 2020. Also, led by Extension and the Maine Campus Compact, the annual Maine Hunger Dialogue has been held at UMaine, UMPI, and UMA over the past four years, and this year the national Universities Fighting World Hunger conference was held at USM.

## II. FINANCIAL SUSTAINABILITY

### A. Student Credit Hour Production

Cooperative Extension does not generate tuition, but we do generate an important portion of our budget from program revenue. In an effort to communicate our revenue-generating capacity we can convert the value of our revenue to student tuition equivalents.

#### Equivalent Student Enrollment Tuition & Fees\*

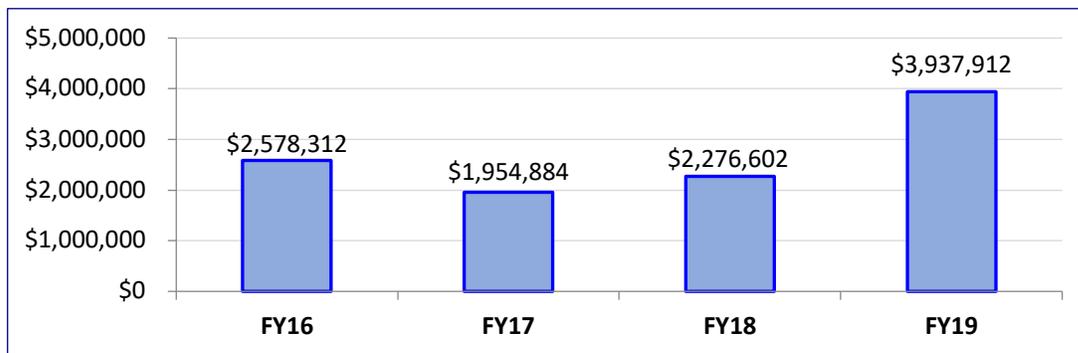
Extension Revenue 2019:	\$4,225,844
Number of Equivalent Student Enrollment Tuition & Fees*	
Undergraduate Maine Resident	757
Undergraduate Non-resident	273

\*Assumptions: 2018 tuition & fees, 15 credit hours per student

### B. Enrollment Collaborations with Enrollment Management – N/A

### C. Research & Grant Funding to Support Research and Extension Outreach Programs

#### Grants – 4-Year Trend



#### New Research Awards

Research Project	Funder	PI	Award	Indirect
Developing Organic Low-bush/Wild Blueberry Weed and Nutrient Mgt.	NESARE / USDA	Calderwood, Lily	\$199,828	\$19,982
Maine Potato Pest Management 2019	Maine Dept of Ag	Dill, Griffin	\$99,571	\$0
Building Social Sustainability on Farms through Online & In Person Education	NESARE / USDA	Forstadt, Leslie	\$197,676	\$19,767
Innovating Organic Grain Growers' IPM Toolbox	NE Integrated Pest Management Center	Mallory, Ellen	\$49,980	\$10,289
Info-tunes and Videos as Delivery Tools for Food Safety Training	USDA NIFA	Machado, Robson	\$73,219	\$17,789
Development of Sulfur Recoms. for Maine Potato Farmers	Maine Department of Ag	Sharma, Lakesh	\$70,539	\$0
Supermarket Science Yrs. 3&4	UNE/USDA NIFA	Yerxa, Kathryn	\$36,404	\$10,911
Developing Corn Silage Systems to meet the needs of Cover Crops	NESARE / USDA	Kersbergen, Richard	\$53,513	\$5,351
Expanding No-Till Organic Vegetable Production Through the Combination of High-Residue Cover Crops and Solarizing Tarps	NESARE / USDA	Lilley, Jason	\$15,361	\$1,535
Maine Integrated Pest Management CPPM-EIP 2017-2020 Yr. 2	USDA	Dill, James	\$175,444	\$0
Developing Eastern Broccoli Industry Yr. 3	Cornell/USDA NIFA	Hutton, Mark	\$20,366	\$4,203
<b>Total of grants \$15,000 and under</b>	Various	Various	<b>\$67,963</b>	<b>\$7,896</b>
<b>Totals:</b>			<b>\$1,059,864</b>	<b>\$78,738</b>

New Outreach Awards

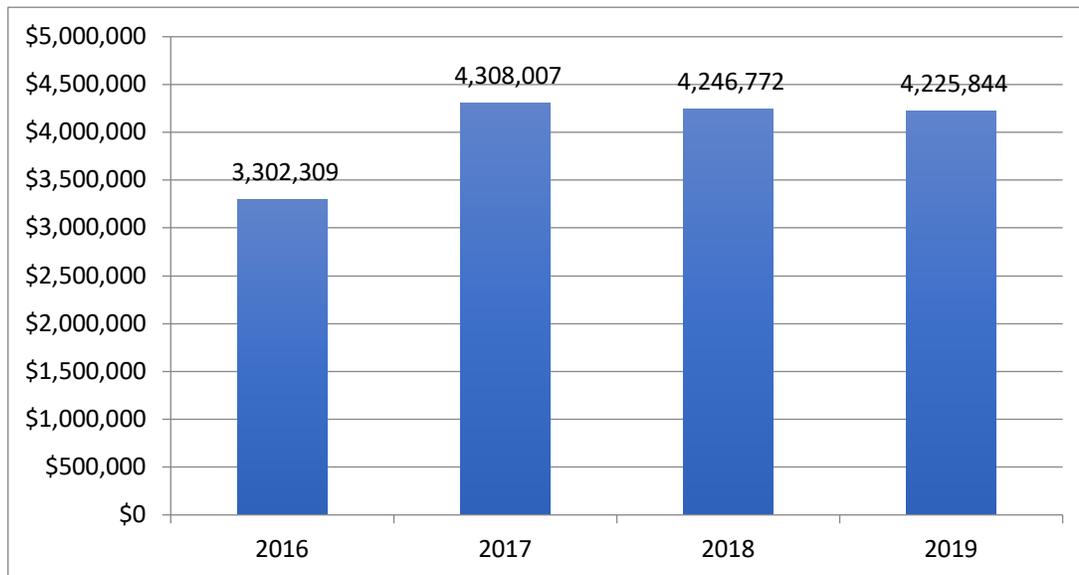
Outreach Project	Funder	PI	Award	Indirect
Respirator: Pesticide Safety	eXtension Foundation	Bernard, Kerry	\$18,925	\$4,696
Maine AgrAbility Continuation Years 1-4	USDA NIFA	Brzozowski, Richard	\$720,000	\$0
Facilitating Communication in Farm Families with Personalized Coaching	USDA NIFA	Forstadt, Leslie	\$46,013	\$13,804
Agricultural Mediation	USDA - Farm Service Agency	Forstadt, Leslie	\$64,400	\$8,400
Camp Northwoods 2018	Maine Dept of IF&W	Fournier, Ron	\$47,600	\$0
Moose Permit Auction 2018	Maine Dept of IF&W	Fournier, Ron	\$174,800	\$0
4-H Shooting Sports Yr. 8	Maine Dept of IF&W	Fournier, Ron	\$35,710	\$1,093
2018-2020 Crop Insurance Education	USDA - Risk Management	Handley, David	\$238,186	\$21,653
2019 Military Extension Adventure Camps	US Department of Defense	Decke, Jessica	\$181,846	\$0
Strengthen Soil Security - Maine Yr. 2	NESARE / USDA	Mallory, Ellen	\$46,662	\$4,665
Maine Families Home Visiting Program	Maine Children's Trust/Maine Department of Health and Human Services	Neff, Wesley	\$267,937	\$46,164
Aspirations Incubator Program Yr. 2	Lerner Foundation	Scott, Ryder	\$89,703	\$0
National Mentoring Program Yr. 9	National 4-H Council/US DOJ	O'Neill, Danielle	\$57,960	\$11,960
Digital Ambassadors	National 4-H Council/Microsoft	Targonski, Alisha	\$93,600	\$9,360
4-H Shooting Sports Yr. 7	Maine Dept of IF&W	Fournier, Ron	\$35,650	\$1,852
2019-2020 Moose Lottery Scholarship	Maine Dept of IF&W	Fournier, Ron	\$189,900	\$0
On Farm Readiness Reviews	Maine Dept of IF&W	Bolton, Jason	\$207,873	\$23,915
Pesticide Editor 2018-2019	Maine Board of Pesticide Control	Dill, James	\$65,000	\$4,954
4-H and Microsoft Youth Community Leaders for Digital Transformation	National 4-H Council/Microsoft	Lobley, Jennifer	\$19,000	\$1,900
Children, Youth, and Families At-Risk Sustainable Communities Proj. Yr. 5	USDA NIFA	Ouellette, Kristy	\$170,000	\$0
Northeast Plant Diagnostic Network	Cornell/USDA NIFA	Smart, Alicyn	\$24,600	\$2,236
National Mentoring Program Yr. 8	National 4-H Council/US DOJ	O'Neill, Danielle	\$57,960	\$11,960
Total of grants \$15,000 and under	Various	Various	\$24,723	\$3,914
Totals:			\$2,878,048	\$172,526

**D. Revenue Centers**

Extension Revenue - 2019

State Appropriation - Special	400,000
State Appropriation	135,000
Sales & Services	156,364
Program Revenue	336,459
Camp Revenue	1,460,221
Merchandise Sales Revenue	5,740
Publication Revenue	12,277
Rental Income	13,420
Other Income	1,223,482
Interdepartmental Credit	482,881
Total	<u>4,225,844</u>

### Extension Revenue 4-Year Trend



#### **E. Private Giving/Alumni Cultivation**

##### Extension Gifts – 2019

Gifts	\$505,630
Fundraising	\$10,469
<b>Total</b>	<b>\$426,034</b>

#### **F. Initiatives to Increase Fiscal Efficiency**

Working with UMS Offices of the General Council and Risk Management, we have created a series of contract templates for licensing and services provided through our camps and other education programs. These new fillable forms allow for clarity and consistency, reduce the obligations of our staff in getting unnecessary parental sign-offs, and minimize review time by the Office of the General Council.

#### **G. Other - NA**

### **III. CULTURE OF EXCELLENCE**

#### **A. Faculty Mentoring and Professional Development**

All Cooperative Extension faculty participate in mentoring and diverse professional development, including the creation of a written professional development plan. We have created mentoring guides for professional and classified employees, and all new employees are assigned a mentor.

#### **B. Faculty Achievements (selected)**

**Anderson, G.** Maine Agriculture Marketing Loan Fund committee member.

**Anderson, G.** Dairy Improvement Fund Eligibility Committee, Dept of Agriculture, Conservation and Forestry.

**Bartlett, C.** Natural Resources Protector and Educator Award from The Commons in Eastport. 2018.

**Dill, J.** New England Higher Education Excellence Award. 2018.

**Forstadt, L.** Faculty Award in Creative Programming for her work focused on farm family communication and resilience. Awarded by the Extension Policy Advisory Committee. 2019.

**Hopkins, K.** Inducted into the North American Maple Syrup Council's Maple Hall of Fame. 2019.

**Jackson, T.** Distinguished Service Award, National Association of Agricultural Agents. 2018.

**Lobley, J.** National Association of Extension 4-H Agents, Northeast Regional Winner for Excellence in 4-H Volunteerism. 2018.

**Mason, M., Ouellette, K., Sparks, S., Personette, L.,** Regional Award, Diversity and Inclusion, Expanding the 4-H Audience. National Association of 4-H Agents, 2019, and will receive the NAE4HA national award in October 2019.

**Mason, M.** Invited to co-chair national sub-committee on Immigrant and Refugee Youth for National 4-H Access, Equity, and Belonging Committee. 2018-19.

**McConnon, J.** Technical Advisory Committee for the Northeast Regional Center for Rural Development. Co-Chair of the Technical Advisory Committee. 2018.

**Moran, R.** Chair of the multistate research and extension project NE1836, Improving Quality and Reducing Losses in Specialty Fruits. 2018.

**Ouellette, K.** Selected by National 4-H Headquarters USDA/NIFA to represent the Northeast region as a member of the chartered group - National 4-H Teaching Models Taskforce, 2017-18 Co-Chair.

**Savoie, K.** National Extension Association of Family and Consumer Sciences (NEAFCS) Distinguished Service Award. 2018.

**Savoie, K.** Faculty Program Leadership Award, Program Advisory Committee, Extension Leadership Team, UMaine Extension. 2018.

**Smart, A.** Peer-review grant panelist for USDA NIFA Small Business Innovation Research Program (SBIR): Plant Production and Protection. 2019.

**Yerxa, K.** Steering committee member of the North East Regional Nutrition Education Center for Excellence administered by Cornell Cooperative Extension.

## C. Research and Scholarship Summary

Over 100 faculty and professionals are actively engaged in applied research and are prolific in scholarship. In 2018-2019, staff were involved in applied research projects, and published over 70 peer-reviewed forms of scholarship including journal articles, abstracts, videos, fact sheets, and bulletins. Extension faculty and professionals were engaged as invited presenters at over 100 state, regional and national events, including conferences, trade organizations, academic institutions, and governmental entities. Our staff also collaborate actively with their international peers. A complete list of scholarly activities accompanies this report.

## D. Curricular Innovations

**Foster Center for Student Innovations:** Dr. Jason Bolton and 4-H Professional Laura Wilson participate in Foster Center programs for youth, small businesses, and food entrepreneurs. Dr. Beth Calder, Dr. Louis Bassano, and Dr. James McConnon have collaborated in offering our Recipe to Market course for aspiring food entrepreneurs. Dr. Bolton was the Innovation Engineering Academic Director for FY 2018.

**Matching Gardeners with Families in Need:** Extension and Maine Families, a home visiting program serving households with children from birth to age 3 have partnered to match gardeners with families in need. Gardeners are matched with families with a wish list for fresh produce, and MF staff distribute the produce, recipes, and food handling tips. This direct delivery model helps break through some of the common barriers to food access - transportation, social stigma, and time - and give small-scale growers a meaningful opportunity to help others.

**Molecular Testing of Phytoplasma:** We initiated this testing for the Maine Department of Agriculture, Cooperative Agriculture Pest Survey. It had previously been handled out of state.

**Sensor-based Cultivation Technology:** Demand for local organic small grains continues to expand in the Northeast, but spring annual weeds, in particular wild mustard and wild radish, are limiting organic farmers' ability to grow organic grains. Extension is collaborating with organic farms in Maine to test two new technologies - automated camera-guided cultivation and selective weed cutting - to reduce in-season weed pressure and seed production. These two tools could dramatically improve organic grain farmers' short and long-term weed management.

**U.S. & Canadian Organic Grain Network:** This is a cross-border network for commercial organic grain farmers, businesses, and advisors in the Northeast, Atlantic Canada and Quebec. Network activities include cross-border farm tours, winter webinars, and a listserv with 72 members from six states and four provinces.

**UMaine Climate and Agriculture Network:** This network fosters increased communication and coordination among those working on issues related to climate and agriculture. Initiated in 2015, the network to date has hosted guest speakers, organized researcher and graduate student mini-symposiums, developed a farmer's fact sheet, and facilitated new collaborations on at least two grant proposals.

**Making the Healthy Choice the Easy Choice:** Extension collaborated with Cornell Cooperative Extension to create an online Policy, Systems and Environmental (PSE) Training for EFNEP and SNAP-Ed professionals titled "Making the Healthy Choice the Easy Choice: An Introduction to Policy, Systems, and Environmental Approaches to Promote Healthy Eating and Physical Activity" (<https://www.ecornell.com/custom/pse/>).

**Learning English Through Cooking (LETC):** Extension and community partners came together to help new Americans learn to speak English through sharing cultural cooking. The group of Iraqi and Afghani women met weekly for a year to cook, learn healthy available substitutions in their recipes, and to practice conversational English. Since the class ended, two participants have begun a small business serving Middle Eastern dishes.

**4-H Summer of Science:** In an effort to increase science proficiencies in local communities and prevent summer learning loss, UMaine Extension created and delivered science curricula at community sites. In 2018, Maine 4-H Summer of Science was in 9 counties at 40 unique sites, including free-or-reduced lunch sites, libraries, summer school programs and summer camps. Community partners included Boys and Girls Clubs, YMCAs, schools, public housing authorities, and local recreation camps. Summer of Science activities were based on “Innovation Engineering”, and included animal adaptation, bioremediation, chromatography, and engineering design. Adult volunteers and 34 teens facilitated activities with over 2,700 youth.

**4-H Tech Changemakers:** With support from the National 4-H Council and Microsoft Philanthropies, the 4-H Tech Changemakers project in Washington County focuses on committed teens creating positive change in their communities. The 3-year pilot was launched in October 2017 and is part of a new national partnership that equips young people with the digital skills and resources they need to make a positive impact in their communities.

#### IV. STUDENT ENGAGEMENT, STUDENT SUCCESS

Cooperative Extension is primarily community based and our program clients primarily non-academic. Our client success is community centered. Here are some highlights for 2018-2019.

**Recipe to Market:** There has been a growing interest in value-added food production in Maine. From farmers looking to add value to their raw products to Maine families interested in turning their favorite recipes into viable food businesses. In response, UMaine Extension developed the Recipe to Market Program in 2007 and has been offering it to statewide audiences annually ever since. The program helps potential and existing food entrepreneurs acquire food science and business knowledge and skills to successfully bring a value-added food product to market. Since its inception, over 400 people have participated in Recipe to Market.

**Follow a Researcher<sup>®</sup>:** FAR<sup>®</sup> was created by UMaine Extension and collaborators to increase youth understanding of the research process by engaging them directly with UMaine researchers in the field. FAR<sup>®</sup> is a UMaine 4-H program using technology and social media to facilitate real-time conversations between youth and graduate student researchers working in remote locations around the world. The program is now a proven model that utilizes technology to engage new audiences with authentic scientific research, humanize the researcher, and make the research process personally relevant. Since 2015, 4,560 youth ages 7 to 18 and over 150 educators have engaged with researchers during expeditions to Peru, the Falkland Islands, Antarctica, and along the coast of Maine. In development is the FAR<sup>®</sup> network, that will enable us to manage expeditions from multiple sites from our new website ([followaresearcher.org](http://followaresearcher.org)) and engage 4-H programs and researchers from other universities to share expeditions with youth and educators from around the world.

**4-H@UMaine Weekend:** Maine 4-H and UMaine hosted 32 youth (grades 6-10), 17 teen leaders, and 27 adult staff and volunteers. In addition to the traditional youth experience for grades 6-10, college-ready teens took part in exclusive training and workshops to further develop leadership skills and connect with campus staff. Ninety two percent of youth participants indicated they learned about new career possibilities, helping to raise their career aspirations, and 94 percent plan to go to college.

#### V. PRESERVING/RESTORING INFRASTRUCTURE

##### A. Renovation or Construction Projects Completed

**Plant, Animal, & Insect Diagnostic Lab:** Construction was completed in the winter of 2017-18, and the grand opening was held on June 21, 2018. The new facility is operational and occupied at a cost exceeding \$10 million from two different public bonds.

**4-H Science Center:** Renovations were completed on the Lafayette and Rawcliffe 4-H Center at UMaine, arising out of a partnership between the UMaine Cooperative Extension and the Maine 4-H Foundation.

**Greenland Point 4-H Camp and Learning Center:** The Maine 4-H Foundation completed renovations at this facility prior to Extension starting educational programs in the summer of 2019.

##### B. Renovation/construction projects planned for coming year

**4-H Camp and Learning Centers:** Actively planning for several significant renovation projects of existing facilities that will be supported through private funding. At Blueberry Cove, construction is planned to begin on two new buildings: a 4-H science/learning center, and a boathouse.

## VI. SUMMARY OF ANTICIPATED CHALLENGES

***Climate Change:*** We are challenged with maintaining our expertise as the effects of climate change alter the metrics of nearly everything we do within the Maine food system. Delivering up-to-date research-based education in a time of rapid change will continue to challenge our capacity. As concern about the timing, magnitude, and rate of future climate change increases, understanding how such change might impact Maine becomes crucially important. Extension provides research and outreach on the effects of climate on Maine agriculture, and collaborates with Maine Sea Grant to support similar efforts for marine fisheries. Maine farmers are already facing the consequences of global climate change, as warmer temperatures have promoted longer growing seasons and migration of new weeds and pests that previously could not withstand Maine's cool climate. Extension faculty and staff develop new knowledge and technologies to address the effects of climate variability and change, and they enhance the adaptive capacity of production and natural systems to reduce exposure and vulnerability to climate change.

***4-H Camp and Learning Centers:*** Our 4-H camps face both challenges and opportunities in terms of their financial vitality. Three of the four camp locations (Tanglewood, Blueberry Cove, and Greenland Point) have infrastructure needs that are essential and expensive.

***Farm Profitability:*** The average farm in Maine is losing money. Extension faculty and staff work to help producers and processors reduce input costs, add efficiencies through technology, and stay competitive within commodity-based agriculture. Extension also helps many small farmers who target local markets and those adding value with on farm processing, for example cheese.

***Farmers and Fishermen:*** Maintaining the ability to farm and fish while experiencing the physical limitations of aging is a problem for many farmers and fishermen, who also are facing succession issues that challenge their ability to pass on their operations to a future generation. AgrAbility is a USDA funded program conducted by Extension in partnership with others that addresses the needs of handicapped farmers. Age related disability is one of the situations this program is addressing. As well, many under-capitalized young people are trying to break into these fields. To support them, Extension conducts "So, You Want to Farm in Maine" to educate the next generation of farmers.

***Food Safety Modernization Act (FSMA) of 2011*** is a result of a federal shift in priorities from responding to food safety issues to preventing them. The resulting rules are complex and overwhelming to both businesses and regulators. This is an important element of Extension's Food System programming and our faculty makes every effort to interpret and disseminate accurate information. Extensions provide FSMA programming that covers two of the seven rules (Human Foods and Produce Safety). This work is done in partnership with the Maine State Department of Agriculture, Conservation and Forestry.

## VII. SUMMARY OF NEW INITIATIVES

***Magic Lantern Innovation Lab and Learning Center:*** A \$4 million fundraising campaign is underway for the 4-H Foundation to purchase and transform the Magic Lantern facility in Bridgton into a 4-H innovation lab and learning center for lakes region youth. Extension will provide leadership and programming for the center that will be a hub of creative activity focusing on educational programming with an emphasis on cross-discipline learning, creative thinking and problem solving. The center's outreach also will include enrichment and experiential education programs in area schools.

## VIII. LICENSURE PASSAGE AND JOB PLACEMENT RATES – N/A

## IX. SUMMARY OF PROGRAM REVIEWS – N/A