

# 2016 Cornell University Research and Extension and NY State Agricultural Experiment Station Research Combined Annual Report of Accomplishments and Results

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## I. Report Overview

### 1. Executive Summary

#### Cornell University Executive Summary

At Cornell University, Federal Capacity Funds are administered strategically to address a wide range of issues in the state and foster integration of applied research and extension programming.

Cornell University Agricultural Experiment Station (CUAES), the New York State Agricultural Experiment Station (NYSAES), and Cornell Cooperative Extension (CCE) work collaboratively to determine planned programs that align with NIFA priority areas and to direct funds to individual research and extension projects as well as projects that integrate research and extension. The approach used to integrate the work of the experiment stations and CCE is designed to serve the citizens of New York State and improve the human condition through excellence in scholarship - linking research, non-formal teaching, and extension to "real life" challenges and opportunities. Director-level staff from CUAES, NYSAES, and CCE meet regularly as an Integrated Program and Research Team (IPaRT) to discuss relevant issues, research and extension projects, and new opportunities.

IPaRT recruits and communicates with a group of richly diverse research and extension stakeholders, who provide input and inform priority-setting for use of Federal Capacity Funds. These stakeholders review proposals submitted through an internal competitive process by which faculty may apply for federal capacity funds for projects with research and extension components matching current priorities. In addition, we have 34 active Program Work Teams comprised of extension educators, faculty, and stakeholders from across New York State who work together to develop, implement, and evaluate priority programs.

University-wide strategic plans have reinforced the land grant research and extension mission. In 2014, a University-wide effort entitled Engaged Cornell was launched to enhance opportunities for students, the university, and communities toward the goal of strengthening opportunities for learning and engagement. Cornell Cooperative Extension has been involved in this effort to increase opportunities for community-engaged research, learning, and service projects. In 2016, a liaison position was created to strengthen collaboration among Cornell students, faculty and staff, and the CCE association offices across the state--supporting development of new university links with association offices and facilitating opportunities for other extension units on campus to strengthen and diversify engagement in New York communities.

The College of Agriculture and Life Sciences (CALS) and the College of Human Ecology (CHE) continue to reinforce the bridges between science and practice, campus community partnerships, and leadership and outreach. The CHE Bronfenbrenner Center for Translational Research is dedicated to expanding, strengthening and accelerating the connections between research, policy, and practice to enhance human development and well-being. Both colleges along with the Industrial Labor Relations (ILR) School of Cornell University and the Cornell University College of Veterinary Medicine are committed to research, teaching and extension, and the need to translate knowledge for public purpose.

This report documents the intentional, planned program work that results from Federal Capacity Funds and the results of formerly funded projects. Planned Programs were addressed collectively by CCE, CUAES, and NYSAES. Further detail, outcome indicators, and success stories are included in the formal report.

Each organization is described below to better explain our unique system at Cornell University.

### **Cornell University Agricultural Experiment Station**

The Cornell University Agricultural Experiment Station (CUAES) - an integral part of three colleges - advances research on food and agriculture systems, the environment, applied economics, and community and individual development. By doing so, CUAES improves people's lives and contributes towards Cornell's Land Grant mission of discovery, engagement, and advancement of learning.

CUAES links Cornell's world-class research facilities with one of the nation's most comprehensive statewide cooperative extension systems. Through this engaged, interactive system we address pressing issues that directly affect the health and welfare of the state and beyond. Many of today's most urgent societal concerns - from childhood obesity to invasive species to global climate change - are not bound by state or national boundaries. With more than 130 years of experience identifying, quantifying, and responding to emerging issues in an ever-changing world, CUAES directs some of the most important projects in the state.

The station directly manages over 5,600 acres of farms and forests, and includes the university compost facility, nine farm operations, and over 177,000 square feet of plant growth facility space--providing critical research services to scientists. Our student-run organic farm, Dilmun Hill, is a model of a student-run agricultural operation that has been emulated by other organizations and universities. Every aspect of our operation - from staff development to forest management to field practices - is viewed through the lens of sustainability.

The Cornell University Agricultural Experiment Station:

- Manages more than \$5.5 million in federal Hatch grants.
- Annually distributes approximately \$1.5 million to new competitively reviewed projects. Federal capacity grants are an essential element of Cornell's research portfolio, supporting applied research that benefits residents of the state, region, and the nation.
- Employs almost 50 full time operations staff and twelve full time administrative staff.
- Operates nine farms with agricultural production and forest acreage across the state, from Willsboro on Lake Champlain to Long Island on the Atlantic Seaboard.

### **New York State Agricultural Experiment Station**

Established in 1880, Cornell's New York State Agricultural Experiment Station (NYSAES) in Geneva develops cutting-edge technologies essential to feeding the world and strengthening New York economies.

From developing safe and nutritious foods to pioneering means to preserve the environment, NYSAES serves millions of New York consumers, agricultural producers, food businesses and farm families throughout the state. NYSAES helps New Yorkers capitalize on new food and agricultural opportunities and is uniquely positioned to translate state-of-the-art research into industry innovation and economic growth.

The New York State Agricultural Experiment Station:

- Operates a budget of approximately \$39 million--roughly one-third of which is funded through SUNY's

base budget.

- Employs nearly 300 staff and over three dozen tenure-track professors.
- Partners with Faculty and Extension Associates: on the range of 10 visiting scientists, 10 postdocs, 25 research and extension associates.
- Extends research and knowledge through students. In recent years there have been 50 to 55 graduate students conducting masters and doctoral studies.
- Encourages cross departmental/Research Association operations: Our four departments -- horticulture; plant pathology and plant-microbe biology; entomology and food science - have faculty in Geneva and Ithaca. The main focus is on improving the genetics, cultivation, production, protection, handling and processing of fruit and vegetable crops.
- Partners with the Northeast Center for Food Entrepreneurship (NECFE), at the NY Food Venture Center at Geneva to provide assistance to over 200 food entrepreneurs annually, promoting sustainable economic development in rural communities.

The NYSAES campus includes:

- The U.S. Department of Agriculture's Plant Genetic Resources Unit (PGRU), responsible for the collection of apple, sour cherry and cold-hardy grapes and selected seed-propagated crops, such as onion, garlic, broccoli, cabbage and winter squash; and the Grape Genetics Resources Unit (GGRU), responsible for the national program on grape genetics and genomics.
- A central Geneva campus made up of 20 major buildings, several smaller buildings for farm machinery storage and similar purposes, and 2 houses with rooms rented to graduate students, visiting scientists, and postdocs.
- Two pilot plants -- the Fruit & Vegetable Processing Pilot Plant and the Vinification & Brewing Technology Laboratory -- provide opportunities for entrepreneurs and processors to add value to the state's raw products.
- The NYS IPM Program
- Cornell Agriculture and Food Technology Park adjacent to the main NYSAES campus
- Research/extension laboratories - Hudson Valley at Highland, NY, and the Cornell Lake Erie Research and Extension Laboratory at Portland, NY.
- Eleven farms for experimental plot work close to the Geneva campus with a total of 870 acres. There is also one acre of greenhouse space on the campus.
- The High Pressure Processing Food Validation Center

### **Cornell Cooperative Extension**

Cornell Cooperative Extension extends Cornell University's land-grant programs to citizens all across New York State. With a presence in every county and New York City, CCE puts research into practice by providing high-value educational programs and university-backed resources that help solve real-life problems, transforming and improving New York families, farms, businesses, and communities.

County associations of Cornell Cooperative Extension work with their local boards, committees, and volunteers to influence decisions on program priorities and delivery. Our county extension associations and multi-county programs are separate 501(c) 3 organizations under the general supervision of Cornell University as agent for the state of New York.

Cornell Cooperative Extension:

- Annually reaches over 1.5 million people directly, and 29 million indirectly.
- Employs 1,462 local and regional staff and educators organized around program initiatives and local needs including 61 regional specialists who focus on dairy and field crops, commercial horticulture, grapes/viticulture, fruit, and vegetables.
- Extends community work by partnering with over 34,000 volunteers who advise, plan, teach and

mentor in all program areas.

- Partners with over 300 Cornell staff and faculty; primarily from the College of Agriculture and Life Sciences and the College of Human Ecology.
- Engages a program development process that relies heavily on community input to identify issues of local importance. Often research is informed by the two-way flow of information and experience.
- Includes 55 distance learning centers and 9 youth camps across New York State, and is fully equipped to deliver events and instruction through various modes including webinars and on-demand videos to remote audiences.

**Collective, planned program areas are described below.**

**AGRICULTURE AND FOOD SYSTEMS:** Support, maintain and develop a NY agriculture industry that is diverse, sustainable, and profitable, which produces a safe, reliable, healthy and local food supply.

**CLIMATE CHANGE:** Engage with multidisciplinary researchers, educators and extension faculty to quantify the current climate trends and prepare for future impacts. This plan also includes related topics - biodiversity and water quality/erosion control.

**ENVIRONMENT, NATURAL RESOURCES, AND SUSTAINABLE ENERGY:** Engage in research and extension that uses available resources - including land and organic waste streams for renewable solutions. This plan also supports research and extension strategies that promote energy and natural resource conservation.

**NUTRITION, FOOD SAFETY AND SECURITY, AND OBESITY PREVENTION:** Support families, youth, communities and the agricultural industry with research and extension connected to childhood obesity prevention; youth, family and community nutrition; food security and food safety.

**4-H YOUTH DEVELOPMENT/CHILDREN, YOUTH, AND FAMILIES:** Enrich the lives of youth and families with research and extension programs. 4-H youth programs focus on life skill development and STEM opportunities. Family programs emphasize human development and social well-being, parenting, economic well-being, and quality of home and work environments.

**COMMUNITY AND ECONOMIC VITALITY:** Empower individuals and communities to make sound decisions for the future through access to research, data and resources, best practices, university-based resources and community education. This plan also supports extension efforts related to entrepreneurship, workforce development, and community-based food systems support through the Master Gardener Volunteer program.

**Total Actual Amount of professional FTEs/SYs for this State**

Year: 2016	Extension		Research	
	1862	1890	1862	1890
Plan	1027.0	0.0	41.0	0.0
Actual	927.0	0.0	39.0	0.0

**II. Merit Review Process**

**1. The Merit Review Process that was Employed for this year**

- Combined External and Internal University External Non-University Panel
- Expert Peer Review

## **2. Brief Explanation**

CUAES, NYSAES and CCE work together on a process of merit review for applied research and extension projects, including review for integrated and multistate activities. Key elements of the process are described below and include statistics from the most current (2016) proposal cycle. Director-level staff from CUAES, NYSAES, and CCE meet regularly as an Integrated Program and Research Team (IPaRT) to discuss relevant issues, research and extension projects, and new opportunities.

### **Submission and Review Process (Research, Extension, and Integrated Projects with Federal Capacity Funds):**

- Principal investigators are asked to consult program priorities (established as outlined in the stakeholder involvement section) and develop pre-proposals for new or revised projects funded by Federal Capacity Funds.
  - PI's who meet eligibility requirements are generally allowed to submit one pre-proposal within each funding stream (e.g. Smith Lever, Hatch, Hatch Multistate), and do so through a robust IT system, which tracks each proposal through its life cycle.
  - Pre-proposals are reviewed for purpose and relevancy by external stakeholders, the principal investigator's department chair, Extension Program Associate/Assistant Directors, and the Agricultural Experiment Station directors (CUAES and NYSAES). Reviews are submitted via a secure website.

### **For research proposals:**

- Agricultural Experiment Station directors make final determination of which pre-proposals shall be developed into full proposals to submit to NIFA.
- Full proposals are reviewed by two or three peer reviewers suggested by the PI and the PI's Department Chair.
- The final proposal is submitted to NIFA through REEPORT. Pending approval by NIFA, Hatch funds are allocated to a unique account associated with their specific project.

### **For extension proposals:**

- Extension Program Directors rank/recommend extension pre-proposals.
- Extension Program Directors meet with Agricultural Experiment Station (Ithaca and Geneva) staff to discuss potential research and extension linkages within extension pre-proposals.
  - Extension Assistant Director, Organizational Development & Accountability reviews for equal program opportunity and affirmative action considerations.
  - Extension Program Directors finalize Smith-Lever funding recommendations.

### **Cornell University Review Criteria:**

- Anticipated significance of results relative to current priority needs or opportunities
- Scientific merit of objectives
- Clarity of objectives
- Appropriate approach and methodology
- Feasibility of attaining objectives
- Accomplishment of previous projects
- Research performance and competence of investigator(s)

- Relevance of the proposed work to state, regional, or national goals
- Impact on underserved audiences
- Level of research-extension integration
- Relevance to stakeholders

### **III. Stakeholder Input**

#### **1. Actions taken to seek stakeholder input that encouraged their participation**

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of the general public
- Survey specifically with non-traditional groups
- Survey specifically with non-traditional individuals
- Survey of selected individuals from the general public

#### **Brief explanation.**

Gaining stakeholder input and encouraging stakeholder participation is a system-wide expectation of all levels and units. Across the system, all of the stakeholder participation methods listed are employed; no single unit uses them all.

At the state level, our Integrated Program and Research Team (IPaRT) works with external stakeholders that provide guidance for CUAES, NYSAES and CCE by reviewing funding support requests. Involvement is intentionally monitored and updated to ensure involvement and ties to traditional and non-traditional constituents, and established and emerging partnerships.

In addition, we have 34 active Program Work Teams (PWTs). PWTs are made up of extension educators, faculty, and stakeholders who work together to determine, develop and implement priority programs within PWTs and to advise IPaRT as needed. PWTs are expected to nurture research-extension integration, to encourage campus-field interactions and collaborations, to take multi-disciplinary approaches, to evaluate their efforts, and to involve their external members in all aspects of their work. More than 1000 participants were involved in the work of these teams in 2016.

Beyond this state-level stakeholder input structure/process, each of Cornell Cooperative Extension's county extension associations continues to work closely with local stakeholders via participation in their local governance structures, i.e. board of directors, and advisory committee structures. In 2016, more than 2,957 board and committee volunteers from diverse backgrounds participated and assisted in the direction, priority setting programs throughout the state, and over 34,000 committed volunteers assisted with program delivery adding to stakeholder involvement.

In local CCE offices stakeholder input is sought from all audiences including under-represented or under-served audiences. One of the strategies used for gaining input and developing working

relationships with new audiences is by networking and partnering with organizations that do have existing and strong relationships with target groups. Local boards of directors and advisory committees also recruit an intentionally diverse membership representative of the people and the needs of the community.

Effective involvement of youth in program determination and implementation is a priority. Our local advisory committees are expected to include youth members as part of the needs assessment and decision-making structure. In 2016, more than 15,000 youth reported serving in appropriate leadership, governance and program delivery roles statewide.

## **2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them**

### **1. Method to identify individuals and groups**

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

#### **Brief explanation.**

Across all levels of the system, all of the techniques listed were used; the mix of methods varied from site to site and program to program. All of our units are expected to have active and diverse advisory processes and to intentionally consider audiences not currently served. The activities of our Integrated Program and Research Team (IPaRT), stakeholders, and PWTs are described in other questions in this section. Needs assessments, focus groups, and user surveys are conducted at the individual level of program units as well as in our statewide plan of work process.

As a method of tracking program needs and input received, CCE educators are expected to submit narrative reports of efforts including efforts intentionally planned to engage underserved populations. For the 2016 reporting year, nearly 25% of the 400 + impact statements were submitted, exemplifying programming intended for underserved audiences: 4-H programs reaching new audiences through afterschool programming and working with other organizations; food and nutrition programs helping mothers, families and food pantry clients to cook well-balanced, affordable meals; parenting programs focusing on families in high-stress situations; resiliency and hope building strategies for families everywhere. Access to these examples can be found here: <http://www2.cce.cornell.edu/plans/Pages/default.aspx>

## **2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them**

### **1. Methods for collecting Stakeholder Input**

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)

- Survey of the general public
- Meeting specifically with non-traditional groups
- Survey specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Survey specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public

**Brief explanation.**

All of the techniques listed were used in 2016 but methods varied site to site and program-to-program across the system. Structures and processes for aggregating data are addressed in this section. The most active data gathering occurred in three venues - local advisory bodies, Program Work Teams (PWTs), and the Integrated Program and Research Team (IPaRT) stakeholders. Web-based surveys, interactive webinars and response to social media also provide programmatic feedback. Examples of efforts to gather stakeholder input include: Adirondack Harvest Farmer/Consumer survey of direct market farmers, delivery and food buyers (CCE Essex); Dairy Grazing Apprenticeship Comes to NY - advisory committee develops viable apprenticeship program (South Central NY Dairy & Field Crops Program - Small Dairy Extension Outreach ); Entry Point Precision Agriculture Technology: Benefits and Costs for Decision Making - identified by Field Crops Advisory Committee as a high priority topic (Northwest NY Dairy Livestock and Field Crops Program - Farm Business Management); Fall Prevention for Seniors in Sullivan - a program response based on survey of seniors and community organizations (CCE Sullivan - Youth & Family Development ); and Frequent Grower Meetings Address Drought (Finger Lakes Grape Program - Tailgate Meetings).

In support of the objectives creating programs that meet the needs of all community stakeholders, Cornell Cooperative Extension requires local Associations to annually review and commit to the CCE Affirmative Action, Diversity and Inclusion Plan (AADIP). AADIP is a comprehensive plan that sets a foundation for building a more diverse and inclusive organization and supports organizational development and sustained culture change.

Preparing staff to understand how to meet the needs of stakeholders is a priority. In 2016 mandatory all-staff training on Title VI Civil Rights were held. Additionally, diversity and inclusion topics were built into every larger staff training effort including New staff orientation, the Program Development Leadership Cohort, Supervisory Development Training, Executive Director Boot Camp - and as the feature of the 4-H Youth Development Diversity and Inclusivity Cohort and Opening Doors Diversity training. These offerings, along with distance learning training in the program development process, help staff learn how to identify local needs and then meet the needs of audiences through programs.

**3. A statement of how the input will be considered**

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans



- To Set Priorities

### **Brief explanation.**

The stakeholder input process for statewide program development jointly utilized by CUAES, NYSAES and CCE was established in February 2001.

Our Integrated Program and Research Team (IPaRT) stakeholders and Program Work Teams (PWTs) work to improve program focus, relevance, and planning activities. Stakeholder input informs Federal Capacity Fund priorities and provides project-specific input on the relevance and value of the proposed work. IPaRT stakeholders provide input that informs decisions around funding of current extension and research projects--contributing ratings of perceived relevance among other rating criteria. Statewide applied research and extension priorities are updated annually, communicated to faculty and staff, and used as a consideration in funding decisions.

County associations of Cornell Cooperative Extension work with their local boards, committees, and volunteers to influence decisions on program priorities and delivery. County extension associations and multi-county programs are separate 501(c) 3 organizations under the general supervision of Cornell University as agent for the state of New York. Their local plans of work are established under the guidance of stakeholders in local advisory structures and governing boards and are in alignment with the statewide plan of work.

### **Brief Explanation of what you learned from your Stakeholders**

Stakeholders help to frame and shape plans of work, funding proposals, programs, and educational activities. System-wide, the Integrated Program and Research Team (IPaRT) stakeholders and Program Work Teams (PWTs) have affirmed a commitment to the NIFA priorities and have elevated needs and opportunities to make use of campus resources for educational programs. Feedback from stakeholders is sought in a variety of ways, welcomed and considered for planning. Communication between CUAES, NYSAES and CCE is open and regular at IPaRT meetings and witnessed through funding decisions.

#### IV. Expenditure Summary

**Institution Name:** Cornell University

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
8525428	0	7052007	0

**Institution Name:** NY State Agricultural Experiment Station

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	0

**Institution Name:** Cornell University

2. Total Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	8525428	0	5693899	0
Actual Matching	8525428	0	11110329	0
Actual All Other	0	0	0	0
Total Actual Expended	17050856	0	16804228	0

**Institution Name:** NY State Agricultural Experiment Station

2. Total Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	0	0	1044099	0
Actual Matching	0	0	1618228	0
Actual All Other	0	0	0	0
Total Actual Expended	0	0	2662327	0

<b>3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous</b>				
<b>Carryover</b>	0	0	5071487	0

**V. Planned Program Table of Content**

<b>S. No.</b>	<b>PROGRAM NAME</b>
1	Agriculture and Food Systems
2	Climate Change
3	Environment and Natural Resources and Sustainable Energy
4	Nutrition, Food Safety and Security, and Obesity Prevention
5	4-H Youth Development/Children, Youth and Families
6	Community and Economic Vitality

**V(A). Planned Program (Summary)**

**Program # 1**

**1. Name of the Planned Program**

Agriculture and Food Systems

Reporting on this Program

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	5%		14%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		6%	
202	Plant Genetic Resources	3%		12%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		3%	
204	Plant Product Quality and Utility (Preharvest)	15%		4%	
206	Basic Plant Biology	10%		1%	
211	Insects, Mites, and Other Arthropods Affecting Plants	5%		14%	
212	Pathogens and Nematodes Affecting Plants	5%		13%	
213	Weeds Affecting Plants	2%		3%	
215	Biological Control of Pests Affecting Plants	3%		8%	
216	Integrated Pest Management Systems	3%		1%	
301	Reproductive Performance of Animals	1%		6%	
302	Nutrient Utilization in Animals	6%		5%	
305	Animal Physiological Processes	2%		1%	
307	Animal Management Systems	8%		2%	
501	New and Improved Food Processing Technologies	6%		2%	
503	Quality Maintenance in Storing and Marketing Food Products	10%		1%	
512	Quality Maintenance in Storing and Marketing Non-Food Products	0%		2%	
601	Economics of Agricultural Production and Farm Management	8%		2%	
604	Marketing and Distribution Practices	8%		0%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

**1. Actual amount of FTE/SYs expended this Program**

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	274.0	0.0	15.0	0.0
<b>Actual Paid</b>	112.7	0.0	18.0	0.0
<b>Actual Volunteer</b>	2607.0	0.0	0.0	0.0

**2. Institution Name:** Cornell University

**Actual dollars expended in this Program (includes Carryover Funds from previous years)**

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1122595	0	2621759	0
<b>1862 Matching</b>	<b>1890 Matching</b>	<b>1862 Matching</b>	<b>1890 Matching</b>
1122595	0	5129179	0
<b>1862 All Other</b>	<b>1890 All Other</b>	<b>1862 All Other</b>	<b>1890 All Other</b>
0	0	0	0

**2. Institution Name:** NY State Agricultural Experiment Station

**Actual dollars expended in this Program (includes Carryover Funds from previous years)**

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	939589	0
<b>1862 Matching</b>	<b>1890 Matching</b>	<b>1862 Matching</b>	<b>1890 Matching</b>
0	0	1411511	0
<b>1862 All Other</b>	<b>1890 All Other</b>	<b>1862 All Other</b>	<b>1890 All Other</b>
0	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

This is a comprehensive program entailing a wide range of applied research activities and multiple education methods depending on context and need. Campus-based faculty and extension associates, regional specialists and county-based educators all are involved in designing, implementing, and evaluating tailored educational efforts depending on the focus and scope of their role.

### Sample Statewide/Regional Initiatives that fall within this Plan of Work

- Capital Area Agriculture and Horticulture Program
- Central NY Dairy & Field Crops Program
- Cornell Vegetable Program
- Eastern NY Commercial Horticulture Program
- Finger Lakes Grape Program
- Harvest NY
- Integrated Pest Management
- Lake Erie Regional Grape Program
- Lake Ontario Fruit Program
- Northern NY Agriculture
- Northwest NY Dairy, Livestock & Field Crops Program
- Pesticide Management Education Program
- South Central NY Dairy and Field Crops Program

## 2. Brief description of the target audience

Key audiences served, directly and indirectly, in enhancing agribusiness viability include: established producers; new and young producers; consultants and service providers; input suppliers; cooperative directors and managers; marketing firms; governmental agencies; lenders; and local/state/federal governmental leaders.

## 3. How was eXtension used?

Cornell Cooperative Extension supports and promotes eXtension communities of practice, the eXtension public site and the professional development offered through eXtension.org. Staff across the state are encouraged to be involved in appropriate COPs, and the link to eXtension is promoted on the front page of the Cornell Cooperative Extension public staff site. Currently, 350 staff are registered, 156 are active users of eXtension, 28 of which are faculty members. Staff have cited the usefulness of COPs - particularly where there are identified national projects - such as with Financial Security for All COP.

Examples of involvement include:

- **Jeff Piestrak**, Outreach Specialist for Mann Library at Cornell, is working with faculty and staff at Cornell, several other LGUs and NIFA to implement recommendations following a research fellowship on **Land Grant Informatics** co-sponsored by eXtension. A focus is making data and information resources more discoverable, shareable and usable in support of Extension programming and impact. That includes a new cross-disciplinary Local & Regional Food Systems initiative at Cornell led by faculty member Anu Rangarajan modeled after and connected to similar efforts at other institutions like MSU and Virginia Tech. Some initial support is being offered by eXtension with additional funding sources being explored.
- **Heidi Mouillesseaux-Kunzman**, Senior Extension Associate with the Community and Regional Development Institute, Development Sociology, co-leads the **Enhancing Rural Community Capacity** Community of Practice. A key focus of the ERCC CoP over the last year is further developing Foundations of Practice, a national training program targeted to community developers. The CoP was selected to participate in eXtension's 2016 Community Issues Corps Designathon to help move this initiative forward.
- **Keith Tidball**, Senior Extension Associate in the Department of Natural Resources and Assistant Director of Cornell Cooperative Extension leads the **Community Capacity Building concentration area of the Military Families Learning Network**, and also serves as a delegate and New York State program lead of the **Extension Disaster Education Network**. Both eXtension networks evolved from eXtension communities of practice.

Examples of participation in COPs that fall into this plan of work area include:

- Agricultural & Food Law
- Agricultural Insect Pests of the Northeast U.S.
- Agriscience/Ag-STEM
- All About Blueberries
- Apples
- Beef Cattle
- Community, Local and Regional Food Systems
- Cooperatives
- Corn and Soybean Production
- DAIReXNET
- Diversity Equity and Inclusion
- Enhancing Rural Capacity
- eOrganic
- Farm Safety and Health
- Foodshed
- Garden Professors CoP
- Goat Industry
- Grapes
- Greenhouse and Nursery Production
- Impact of Climate Change on Agriculture
- Invasive Species
- Niche Meat Processor Assistance Network
- Pesticide Environmental Stewardship
- Plant Breeding and Genomics
- Precision Agriculture
- Sheep
- Small and Backyard Flocks
- Sustainability Education
- Sustainable Ag Energy
- Urban Integrated Pest Management
- Women in Ag Learning Network
- Youth Agriculture

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	399052	7207193	33441	603971

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

Year: 2016  
 Actual: 14



**Patents listed**

Four applications titled: Fagopyritol Synthase Genes and Uses Thereof.

Ten applications titled: Compositions and Methods for Enhancing Germination

Application Numbers

- 15/194,129
- 15/194,156
- 15/194,221
- 15/194,232
- MX/a/2015/016399
- A201511400
- BR1120150300111
- 2015/09225
- 2,912,267
- 2.01E+11
- 2014274487
- 14803497.8
- 73900/CHENP/2015
- 2015156089

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
Actual	1	325	326

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- {No Data Entered}

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	(1.1a) Number participants documented to have applied knowledge or skills gained to strengthen existing business operations.
2	(1.1b) Number of participating family-owned agricultural/ horticultural/natural resources businesses that plan for succession, transfer, or sale of their business.
3	(1.1c) Number of participants reporting improved agricultural/ horticultural business profitability attributed at least in part to program participation.
4	(1.1d) Number of business owners successfully completing an intergenerational transfer or other desired dispensation of their business attributed at least in part to program participation.
5	(1.2a) Number of participants who demonstrate knowledge gains related to needs of potential employees and/or availability of qualified employees.
6	(1.2b) Number of participants documented to have made one or more changes in human resources practices to enhance labor availability or retention.
7	(1.2c) Number of producers/ horticultural businesses reporting improved labor availability, performance, and/or retention of higher skilled and more valuable human resource team members attributed at least in part to program participation.
8	(1.3a) Number of participants documented to have adopted innovations in food enterprises including production, allied services, processing, and distribution.
9	(1.3b) Number of participants or producer groups who adopt practices of value-added production through retaining control of their product further in the processing chain, starting their own value added business, or forming alliances.
10	(1.3c) Number of new food, horticultural, and agricultural businesses and/or new enterprises within existing businesses reported by program participants and attributed at least in part to program participation.
11	(1.4a) Number of producers, horticulture business persons, and/or natural resource managers modifying existing practices and/or adopted new production best practices or technologies to address current issues and improve yield efficiency, consistency and/or quality and/or conservation of resources.
12	(1.4b) Number of producers, horticulture business persons, and/or natural resource managers who report improved ability to anticipate and respond to environmental and market variations through alternative production management strategies.
13	(1.4c) Number of technical assistance providers documented to have incorporated current best management practices in their recommendations.
14	(1.4d) Number of producers or horticulture business persons, reporting increased dollar returns per acre or reduced costs per acre.
15	(1.5a) Number of producers, horticulture businesses, and/or natural resource managers documented to have assessed potential environmental impacts of their operations and developed and acted on plans to eliminate or minimize those concerns.
16	(1.5b) Number of producers, horticulture businesses, and/or natural resource managers documented to have developed and implemented nutrient management and/or waste management plans or modified existing plans to meet production and environmental goals or regulations.

17	(1.5c) Number of producers, horticulture businesses, and/or natural resource managers documented to meet or exceed current environmental protection standards as a result of participating in relevant educational programs.
18	(1.5d) Number of resource managers reporting reduced environmental concerns for participating enterprises.
19	BlightPro: The Next Generation of Plant Disease Forecasting
20	Expanding the Role of Cover Crops in Sustainable Cropping Systems
21	Testing Small Hives as a Management Tool for Sustainable Beekeeping
22	Breeding and Genetics of the Small Grain Cereals
23	Wine Grape Evaluation

**Outcome #1**

**1. Outcome Measures**

(1.1a) Number participants documented to have applied knowledge or skills gained to strengthen existing business operations.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	2510

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
503	Quality Maintenance in Storing and Marketing Food Products
604	Marketing and Distribution Practices

## **Outcome #2**

### **1. Outcome Measures**

(1.1b) Number of participating family-owned agricultural/ horticultural/natural resources businesses that plan for succession, transfer, or sale of their business.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	195

### **3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
601	Economics of Agricultural Production and Farm Management

## **Outcome #3**

### **1. Outcome Measures**

(1.1c) Number of participants reporting improved agricultural/ horticultural business profitability attributed at least in part to program participation.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	1237

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
301	Reproductive Performance of Animals
307	Animal Management Systems
501	New and Improved Food Processing Technologies
503	Quality Maintenance in Storing and Marketing Food Products
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices

**Outcome #4**

**1. Outcome Measures**

(1.1d) Number of business owners successfully completing an intergenerational transfer or other desired dispensation of their business attributed at least in part to program participation.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	76

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices

**Outcome #5**

**1. Outcome Measures**

(1.2a) Number of participants who demonstrate knowledge gains related to needs of potential employees and/or availability of qualified employees.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	72

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
501	New and Improved Food Processing Technologies
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices

**Outcome #6**

**1. Outcome Measures**

(1.2b) Number of participants documented to have made one or more changes in human resources practices to enhance labor availability or retention.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	10

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
601	Economics of Agricultural Production and Farm Management

### **Outcome #7**

#### **1. Outcome Measures**

(1.2c) Number of producers/ horticultural businesses reporting improved labor availability, performance, and/or retention of higher skilled and more valuable human resource team members attributed at least in part to program participation.

#### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

#### **3a. Outcome Type:**

Change in Condition Outcome Measure

#### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	14

#### **3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
601	Economics of Agricultural Production and Farm Management

### **Outcome #8**

#### **1. Outcome Measures**

(1.3a) Number of participants documented to have adopted innovations in food enterprises including production, allied services, processing, and distribution.

#### **2. Associated Institution Types**



- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	994

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
501	New and Improved Food Processing Technologies
503	Quality Maintenance in Storing and Marketing Food Products
604	Marketing and Distribution Practices

**Outcome #9**

**1. Outcome Measures**

(1.3b) Number of participants or producer groups who adopt practices of value-added production through retaining control of their product further in the processing chain, starting their own value added business, or forming alliances.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	486

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
501	New and Improved Food Processing Technologies
503	Quality Maintenance in Storing and Marketing Food Products
604	Marketing and Distribution Practices

**Outcome #10**

**1. Outcome Measures**

(1.3c) Number of new food, horticultural, and agricultural businesses and/or new enterprises within existing businesses reported by program participants and attributed at least in part to program participation.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	377

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

## Results

### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
501	New and Improved Food Processing Technologies
503	Quality Maintenance in Storing and Marketing Food Products
604	Marketing and Distribution Practices

### Outcome #11

#### 1. Outcome Measures

(1.4a) Number of producers, horticulture business persons, and/or natural resource managers modifying existing practices and/or adopted new production best practices or technologies to address current issues and improve yield efficiency, consistency and/or quality and/or conservation of resources.

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

#### 3a. Outcome Type:

Change in Knowledge Outcome Measure

#### 3b. Quantitative Outcome

<b>Year</b>	<b>Actual</b>
2016	6650

#### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

**What has been done**

**Results**

### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
204	Plant Product Quality and Utility (Preharvest)
211	Insects, Mites, and Other Arthropods Affecting Plants

212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
503	Quality Maintenance in Storing and Marketing Food Products

## **Outcome #12**

### **1. Outcome Measures**

(1.4b) Number of producers, horticulture business persons, and/or natural resource managers who report improved ability to anticipate and respond to environmental and market variations through alternative production management strategies.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	4383

### **3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
501	New and Improved Food Processing Technologies
503	Quality Maintenance in Storing and Marketing Food Products
604	Marketing and Distribution Practices

### **Outcome #13**

#### **1. Outcome Measures**

(1.4c) Number of technical assistance providers documented to have incorporated current best management practices in their recommendations.

#### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

#### **3a. Outcome Type:**

Change in Action Outcome Measure

#### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	398

#### **3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
216	Integrated Pest Management Systems
501	New and Improved Food Processing Technologies
503	Quality Maintenance in Storing and Marketing Food Products
604	Marketing and Distribution Practices

### **Outcome #14**

#### **1. Outcome Measures**

(1.4d) Number of producers or horticulture business persons, reporting increased dollar returns per acre or reduced costs per acre.

#### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	2956

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
501	New and Improved Food Processing Technologies
503	Quality Maintenance in Storing and Marketing Food Products
604	Marketing and Distribution Practices

**Outcome #15**

**1. Outcome Measures**

(1.5a) Number of producers, horticulture businesses, and/or natural resource managers documented to have assessed potential environmental impacts of their operations and developed and acted on plans to eliminate or minimize those concerns.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	1823

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
206	Basic Plant Biology
215	Biological Control of Pests Affecting Plants
216	Integrated Pest Management Systems
307	Animal Management Systems

**Outcome #16**

**1. Outcome Measures**

(1.5b) Number of producers, horticulture businesses, and/or natural resource managers documented to have developed and implemented nutrient management and/or waste management plans or modified existing plans to meet production and environmental goals or regulations.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	1011

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
307	Animal Management Systems

**Outcome #17**

**1. Outcome Measures**

(1.5c) Number of producers, horticulture businesses, and/or natural resource managers documented to meet or exceed current environmental protection standards as a result of participating in relevant educational programs.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	720

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
216	Integrated Pest Management Systems
501	New and Improved Food Processing Technologies



**Outcome #18**

**1. Outcome Measures**

(1.5d) Number of resource managers reporting reduced environmental concerns for participating enterprises.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	132

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
216	Integrated Pest Management Systems

**Outcome #19**

**1. Outcome Measures**

BlightPro: The Next Generation of Plant Disease Forecasting

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Each year, commercial growers apply up to 2,000 tons of fungicide to prevent and treat late blight of potatoes and tomatoes. Late blight is a serious fungal disease responsible for many past and present crop failures, including the well-known and widespread famine in Europe in the 19th Century. While some basic forecasting tools exist to help producers plan for and manage the disease, greater precision in both time and geographic space would improve crop survival, reduce costs, and minimize environmental impacts by eliminating unnecessary fungicide applications and directing applications to crops that are most in need.

**What has been done**

Dr. William Fry and his collaborators on the project (NYC-153421) developed an innovative disease forecasting system called BlightPro that integrates the most important predictors of late blight infection. Predictors include actual and forecasted weather, crop information, host resistance, and details on specific strains of the pathogen. Unlike its predecessors, BlightPro operates in real time and uses specific information about the pathogen(s) present in growers' fields to inform the models, resulting in farm-specific forecasts of late blight infection.

**Results**

Over the course of the 3-year project, BlightPro was developed, tested, and released to the greater community as a mobile and web application (<http://blight.eas.cornell.edu/blight/>). The research team introduced the application to potential users through workshops, meetings, and publications in grower magazines, while results were delivered to the scientific community through five peer-reviewed publications. Growers in at least eight states have started using BlightPro in their operations. Early evaluations and simulations indicate that it improves disease suppression and results in more efficient fungicide use than the standard grower practice of weekly applications. Researchers expect that employing the software can reduce fungicide use by as much as 10% - 20%, greatly minimizing both pesticide costs and environmental impacts. Preliminary economic analyses by scientists at Purdue University support the economic benefits of these projections.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants

**Outcome #20**

**1. Outcome Measures**

Expanding the Role of Cover Crops in Sustainable Cropping Systems

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Cover crops provide myriad benefits to producers and the environment, including reduced erosion and improved soil health, weed suppression, supplemental forage for livestock, and enhanced resilience to weather variability caused by climate change. Despite evidence that cover crops improve agricultural sustainability, they are underutilized in the Northeast. Farmers often cite lack of time to establish cover crops after fall harvest as being a major barrier to their adoption. Effective management strategies are needed to facilitate establishment, decrease costs, and increase the value of cover crops to farmers.

**What has been done**

As part of his Hatch project (NYC-125432), Dr. Matt Ryan and his colleagues at the Cornell Sustainable Cropping Systems Lab developed a multifaceted approach aimed at increasing cover crop utilization in agronomic crops in the Northeast. They performed a series of experiments and on-farm trials that included evaluating the benefits of a cover crop drill-interseeder, assessing the success of organic soybeans no-till planted into roll-cripped cover crops, and demonstrating the advantages of cover crops used as forage. They disseminated results to farmers, extension educators, and students through a variety of media, including workshops, newsletters, conferences, and peer-reviewed publications.

**Results**

As a result of this research and outreach addressing knowledge and technology barriers, several organic farmers in New York State have adopted practices that were developed as part of this

project. In fact, members of both farms where on-farm trials were conducted have been instrumental in communicating the benefits to other producers. By diversifying crop rotations, especially when cover crops are harvested for forage, farms will be more resilient and adaptable when cropping plans are disrupted by extreme weather events. They will also enjoy the many other agricultural and ecosystem services provided by cover crops. Almost two dozen publications have resulted from this work, as well as over 40 presentations and other communications. Additionally, a cover crop module was added to the nitrogen management program Adapt-N, so farmers can determine how cover crops affect optimum nitrogen fertilizer application rates.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships

**Outcome #21**

**1. Outcome Measures**

Testing Small Hives as a Management Tool for Sustainable Beekeeping

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The parasitic mite Varroa destructor is responsible for massive losses of honey bees in the US, spreading deadly viruses and bacteria that eventually kill entire colonies if not managed by beekeepers. Currently, the primary treatment is miticides. This approach is not sustainable because it leads to contamination of hive equipment and products, the evolution of resistance by parasites, and often has negative side effects on the bees. New, sustainable, and natural management practices are necessary for reducing disease and improving the long-term health of the beekeeping industry and agricultural sectors that rely on pollination by honey bees.

**What has been done**

This project (NYC-191400), led by Dr. Thomas Seeley, tested a management tool that mimics how feral honey bee colonies survive infestations of Varroa mites without miticide treatments. Seeley hypothesized that smaller hives, like natural nest cavities, would force bees to rear less

brood and swarm more frequently, thereby providing fewer opportunities for mite reproduction. He compared the population dynamics and survivorship of two groups of genetically matched colonies that lived in small or large hives, representing wild and managed colonies respectively.

### Results

Researchers found that colonies kept in small hives swarmed more often and experienced much less mortality from viruses spread by the mites compared to colonies kept in larger hives. One of the most fundamental manipulations that beekeepers make to increase honey production is to increase hive size by as much as four times that of natural hives, thereby increasing space for brood production and honey storage and decreasing swarming activities. Unfortunately, this manipulation also improves conditions for mite infestation and boosts colony mortality. These findings provide a valuable alternative to the unsustainable use of miticides. More broadly, this work marks an important stage in the growing movement toward sustainable beekeeping, which allows bees to live more naturally and make full use of the suite of adaptations they have developed over their 30-million-year history.

## 4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
216	Integrated Pest Management Systems

### Outcome #22

#### 1. Outcome Measures

Breeding and Genetics of the Small Grain Cereals

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

#### 3a. Outcome Type:

Change in Action Outcome Measure

#### 3b. Quantitative Outcome

Year	Actual
2016	0

#### 3c. Qualitative Outcome or Impact Statement

##### Issue (Who cares and Why)

Continually improving small grain varieties is important for the sustainability of New York State agriculture. Developing, cultivating, and introducing superior varieties of small grains that show improved yield, nutritional value, disease resistance, and other traits that increase crop value

contributes to the economic and nutritional wellbeing of rural communities. Stakeholders in New York and the northeastern United States depend on novel and improved grains that are safe, efficient, and stable in this region.

#### **What has been done**

For more than a century, the Cornell Small Grains Project has been developing and improving superior crop varieties. In addition to Cornell's own varieties, Mark Sorrells and his team also evaluate public and private varieties from other programs. Funding from his Hatch project (NYC-149430) enabled his team to devise and evaluate novel breeding methods, including marker-assisted breeding and genomic selection, which effectively manipulate genetic variability for desired traits. Further, they began to elucidate important genetic characteristics that control agronomic crop properties, specifically pre-harvest sprouting, fusarium head blight (FHB), and nutritional quality in grains.

#### **Results**

Small grains researchers continued evaluations of yield, disease and lodging resistance, and quality traits for public and private varieties, including winter and spring wheat, winter and spring barley, spring oats, triticale, and rye. They also released three new varieties into production: Medina soft white winter wheat, which exhibits excellent resistance to FHB, pre-harvest sprouting, and soil-borne viruses, and Ostego and Erie soft red winter wheat. During the project, NYS passed a Farm Brewery Bill providing tax incentives to brewers who use locally sourced ingredients. In response to the growing interest in craft malting and brewing, Cornell researchers initiated a malting barley breeding program and began testing varieties from around the world. The small grains program continues to be critically important and relevant for New York growers as well as for the next generation of plant breeders, who all benefit from a modern breeding program that integrates conventional and modern molecular technologies.

#### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
601	Economics of Agricultural Production and Farm Management

#### **Outcome #23**

##### **1. Outcome Measures**

Wine Grape Evaluation

##### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

##### **3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Access to new wine grape cultivars is a continuing interest for NY and eastern growers, who face many climate-related challenges, including the need to address intensive disease management and economically-risky late season fruit rots (e.g. botrytis). Poorly performing plant material can be a costly mistake. For example, current estimates are \$20-30,000 to plant an acre of grapes on Long Island. Before investing in a new vineyard, producers need reliable information on vine performance, management, and unique wine attributes.

**What has been done**

This project included 3 cultivar evaluation efforts: The NE1020 coordinated variety trials (cool/cold hardy hybrids), the Long Island cultivar evaluation trial, and loose-clustered Vignoles clonal selections produced by USDA-ARS's GGRU. The goal is to provide NY growers with cultivars that are more disease resistant, adapted to local mesoclimates, and offer new flavor attributes to expand the range of wines that the industry produces. Novel techniques for reducing berry set were examined in order to reduce cluster susceptibility to Botrytis and other cluster rots. Leaf removal at trace bloom shows promise for reducing cluster compactness. Similarly, use of anti-transpirants pre-bloom have been shown to reduce berry set. Trials in LI and FL commercial vineyards will provide information on costs, benefits, and impact on cluster-compactness.

**Results**

Data from trials enables an informed decision when planting a new vineyard. Variety trial results are diverse, reflecting the differing performance of the 37 varieties and clones evaluated. A complete chart of results was posted on the CCE-Suffolk County grape program website (>1000 hits in 2016) in winter, 2016 <http://ccesuffolk.org/agriculture/grape-program> . In a recent survey, 90% of growers used information from this trial to make planting decisions in their vineyard. Impacts of this 20-year evolving trial were summarized in an article in Appellation Cornell (<https://grapesandwine.cals.cornell.edu/newsletters> ) and in Wines and Vines, a national trade publication for the wine grape industry. The loose clustered Vignoles clones produced by irradiation have been evaluated by USDA. Ten have been selected for a field planting in Western NY. Looser clusters are expected to reduce the need for expensive botrycides, and lower the risk of fruit rots significantly for this important wine grape cultivar.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms
202	Plant Genetic Resources
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
212	Pathogens and Nematodes Affecting Plants
601	Economics of Agricultural Production and Farm Management

## V(H). Planned Program (External Factors)

### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

### Brief Explanation

Agricultural/horticultural/natural resources enterprises operate in a complex and volatile context involving susceptibility to weather extremes, changing governmental policies and regulations, competitive land uses and shifting development patterns, evolving consumer demands, and globally influenced markets. During the last couple of years highly damaging flood events damaged crop and forest resources in highly productive areas of New York. Recovery is slow for many areas. Fundamental change is occurring in the state and regional economies within which agricultural/horticultural/natural resources enterprises operate. The specific implications of these external factors vary greatly by locale and across commodities and business forms in some cases creating new market opportunities and in others erosion of traditional markets. Population and land use changes in farming communities has led in some places to producer/neighbor issues that influence choice of production practices. Economic stress exacerbates issues of food insecurity and hunger and many community organizations are over- burdened and unable to meet demands. There is a growing interest by consumers, communities and producers to market local foods locally. This interest continues to influence programs, research and funding availability. These trends are expected to continue.

## V(I). Planned Program (Evaluation Studies)

### Evaluation Results

Each of the plans addresses a broad combination of applied research and extension initiatives spanning multiple audiences, methods, and intended outcomes. A combination of routine program monitoring and documentation, near-term outcome assessment, and targeted follow-up activities are expected to provide a comprehensive assessment. We work towards this goal by doing two things - professional development to enhance evaluation capacity of our system and collecting quantitative and qualitative documentation of local, regional and statewide programs.

**Evaluation Capacity Building:** Cornell Cooperative Extension has worked with the Cornell Office of Research on Evaluation (CORE) to strengthen evaluation practice and build evaluation capacity. CORE developed The Systems Evaluation Protocol that takes programs from logic models (columnar) to pathway models (a visual model that shows the



relationship of short-term, mid-term and long-term outcomes) and helps to create an evaluation strategy. CORE tested and refined The Systems Evaluation Protocol in partnership with CCE programs from 2006 - 2015. The Protocol has been integrated into professional development in CCE, to promote consistent approaches to evaluation of county-based, regional, and statewide programs. Although the formal project connection with CORE ended in 2015, access to the Netway and online training continues to be available. Additionally, CCE program leaders are being trained in logic and pathway modeling through the CCE Program Development Leadership Cohort, an in-depth and comprehensive professional development experience targeting program leaders to become more proficient at program planning and evaluation.

**Regional/Statewide documentation examples.** Many regional and statewide programs are receiving federal capacity funds. Documentation of outcomes is a requirement of funding. Results shape future program efforts and impact program design. **An example evaluation from a funded project can be found below.**

**There is also a requirement for our local and regional programs to report on statewide outcomes/indicators:** Program documentation results are aggregated in a statewide accountability database that includes both qualitative and quantitative data for reporting and helping us to better understand impacts. Quantitative system-wide outcome data is reported in the outcome portion of this report.

## Key Items of Evaluation

Example evaluation for the Agriculture and Food Systems Plan - Corn/Soybean Seeding Depths (William Cox) - use of participatory research in which farmers operate field-scale equipment while testing different crop management practices in 10-20 acre corn or soybean experiments on their farms.

It has been found that farmers value field-scale studies on commercial farms more than on small-plot research on University farms.

This study combined small plot research at the Musgrave Farm evaluating corn hybrid or soybean variety maturity, planting dates, and seeding depths with field-scale studies on grower fields. In addition to small plot research, six 6 leading New York corn and soybean growers in central and western NY were enlisted as cooperators. The field scale studies with the growers using their equipment and management practices validated small plot research, which in turn increased the impact of the results. When presenting the information at Winter Workshops, corn and soybean growers were far more engaged and interested in the results with a leading farmer in their county or region than the small plot research conducted in Cayuga County.

More detail about this project can be found at:

- <https://scs.cals.cornell.edu/people/william-cox>

**V(A). Planned Program (Summary)**

**Program # 2**

**1. Name of the Planned Program**

Climate Change

Reporting on this Program

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	0%		3%	
104	Protect Soil from Harmful Effects of Natural Elements	7%		0%	
111	Conservation and Efficient Use of Water	15%		0%	
112	Watershed Protection and Management	17%		15%	
125	Agroforestry	5%		0%	
132	Weather and Climate	14%		7%	
133	Pollution Prevention and Mitigation	10%		19%	
135	Aquatic and Terrestrial Wildlife	8%		23%	
136	Conservation of Biological Diversity	15%		7%	
141	Air Resource Protection and Management	2%		3%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	2%		0%	
405	Drainage and Irrigation Systems and Facilities	5%		0%	
902	Administration of Projects and Programs	0%		23%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	69.0	0.0	5.0	0.0
<b>Actual Paid</b>	15.3	0.0	6.0	0.0
<b>Actual Volunteer</b>	2166.0	0.0	0.0	0.0

2. Institution Name: Cornell University

Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
152873	0	900692	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
152873	0	1763830	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**2. Institution Name:** NY State Agricultural Experiment Station

**Actual dollars expended in this Program (includes Carryover Funds from previous years)**

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	6376	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	54547	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

The initiative is guided by faculty and staff involved with several programs:

- The Cornell Climate Change Program Work Team (PWT) was formed in 2010 and currently has more than sixty five members comprised of Cornell faculty, staff, Cornell Cooperative Extension educators from around New York State, and external stakeholders who are working to advance climate change research and outreach programs. The PWT provides a mechanism through which faculty and extension educators connect with stakeholders to identify the needs surrounding climate change impacts and opportunities in New York State, create educational materials, and design learning experiences that address these needs. You can view the list of Climate Change PWT members at the Cornell Cooperative Extension website.

- The Cornell Institute for Climate Smart Solutions is focused on supporting farmers of New York and beyond with decision tools for strategic adaptation to climate change, so that they are better able to cope with potential negative effects of climate change and extreme weather events, and are better able to take advantage of any opportunities that it might bring.

- The Cornell Cooperative Extension (CCE) system extends Cornell University's land-grant programs to

- The Atkinson Center for a Sustainable Future's (ACSF) Climate Change Focus Group began in 2008 and currently has 17 interdisciplinary faculty members from across campus, representing disciplines such as: climate science, ecology, agriculture, engineering, economics, history, and social sciences, that guide research and teaching at the University.
- NY EDEN <http://emergencypreparedness.cce.cornell.edu/Pages/default.aspx> The New York Extension Disaster Education Network (NY EDEN) is a collaborative educational network based at Cornell University, dedicated to educating New York residents about preventing, preparing for and recovering from emergencies and disasters that could affect their families and communities. NY EDEN is affiliated with both the national USDA EDEN network and with Cornell University Cooperative Extension.
- NYS Integrated Pest Management <http://www.nysipm.cornell.edu/> - Research, demonstrations, education, and outreach are part of a comprehensive plan to make IPM the safe, effective pest management solution for all New Yorkers. Solutions that help protect our health, our economic well-being, and our environment.
- Invasive Species Education and Monitoring Efforts: <http://www.nyis.info/> The Mission of the Clearinghouse is to be a gateway for New Yorkers to access timely, accurate scientific and policy information to assist them in making informed decisions about preventing, eradicating, controlling and managing invasive species in New York State and to focus attention on the need for invasive species prevention, eradication and management in New York. The Clearinghouse also provides information on upcoming invasive species events and invasive species news of interest to New Yorkers. The Clearinghouse has subsumed the National Aquatic Nuisance Species Clearinghouse and its Aquatic Invasive Species Database and has formed linkages with the New York Invasive Species Database (iMapInvasives), the New York Invasive Species Research Institute at Cornell, and numerous State and Federal agency invasive species programs. The Clearinghouse works closely with the State's eight PRISMs (Partnerships for Regional Invasive Species Management - see navigation bar PRISM tab) to support them in their invasive species activities.
- Master Watershed Stewards Program <https://blogs.cornell.edu/humandimensions/ny-master-watershed-steward-program/>. The mission of the New York Master Watershed Steward Program is to strengthen local capacity for successful management and protection of watersheds by empowering volunteers.
- Stormwater management training is part of the Cornell Local Roads program which provides training and technical assistance to local highway and public works officials in New York State. Stormwater Management <http://www.clrp.cornell.edu/workshops/stormwater.html>

## **2. Brief description of the target audience**

Key audiences served, directly and indirectly include: agricultural, horticultural and natural resource producers; consultants and service providers, resource managers, governmental agencies, and local/state/federal governmental leaders and policy makers, non-government organizations, individual consumers, and youth.

### 3. How was eXtension used?

Cornell Cooperative Extension supports and promotes eXtension communities of practice, the eXtension public site and the professional development offered through eXtension.org. Staff across the state are encouraged to be involved in appropriate COPs, and the link to eXtension is promoted on the front page of the Cornell Cooperative Extension public staff site. Currently, 350 staff are registered, 156 are active users of eXtension, 28 of which are faculty members. Staff have cited the usefulness of COPs - particularly where there are identified national projects - such as with Financial Security for All COP.

Examples of involvement include:

- **Jeff Piestrak**, Outreach Specialist for Mann Library at Cornell, is working with faculty and staff at Cornell, several other LGUs and NIFA to implement recommendations following a research fellowship on **Land Grant Informatics** co-sponsored by eXtension. A focus is making data and information resources more discoverable, shareable and usable in support of Extension programming and impact. That includes a new cross-disciplinary Local & Regional Food Systems initiative at Cornell led by faculty member Anu Rangarajan modeled after and connected to similar efforts at other institutions like MSU and Virginia Tech. Some initial support is being offered by eXtension with additional funding sources being explored.
- **Heidi Mouillesseaux-Kunzman**, Senior Extension Associate with the Community and Regional Development Institute, Development Sociology, co-leads the **Enhancing Rural Community Capacity** Community of Practice. A key focus of the ERCC CoP over the last year is further developing Foundations of Practice, a national training program targeted to community developers. The CoP was selected to participate in eXtension's 2016 Community Issues Corps Designathon to help move this initiative forward.
- **Keith Tidball**, Senior Extension Associate in the Department of Natural Resources and Assistant Director of Cornell Cooperative Extension leads the **Community Capacity Building concentration area of the Military Families Learning Network**, and also serves as a delegate and New York State program lead of the **Extension Disaster Education Network**. Both eXtension networks evolved from eXtension communities of practice.

Examples of participation in COPs that fall into this plan of work area include:

- Agricultural Insect Pests of the Northeast U.S.
- Climate, Forests and Woodlands
- Diversity Equity and Inclusion
- Impact of Climate Change on Agriculture
- Invasive Species
- Pesticide Environmental Stewardship
- Sustainability Education
- Sustainable Ag Energy
- Urban Integrated Pest Management

### V(E). Planned Program (Outputs)

#### 1. Standard output measures

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	197248	11411260	10783	623822

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

Year: 2016  
Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
Actual	0	93	93

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- {No Data Entered}

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	(2.1a) Number of consumers, residents, agricultural/ natural resources producers, organization and business representatives, and/or local government and community leaders who demonstrate knowledge gains about on the causes and implications of climate change and adaptive or mitigating strategies.
2	(2.1b) Number of agricultural/ natural resources producers, organization and business representatives documented to have adopted recommended adaptation strategies for production agriculture and natural resources management, including invasive species, pest management, pollutant loads, wetlands, etc.
3	(2.1c) Number of agencies/ organizations/ communities documented to have adopted recommended climate mitigation practices and policies.
4	(2.2a) Number of consumers, residents, agricultural/ natural resources producers, organization and business representatives, and/or local government and community leaders documented to have modified existing practices or technologies and/or adopted new practices to protect/enhance water resources.
5	(2.2b) Number of documented instances when consumers, residents, agricultural/ natural resources producers, organization and business representatives, and/or local government and community leaders have improved and/or protected water resources.
6	(2.3a) Number of consumers, residents, agricultural/ natural resources producers, organization and business representatives, and/or local government and community leaders documented to have modified existing practices or technologies and/or adopted new practices to protect/enhance natural resources and/or enhance biodiversity.
7	Improving Roadside Ditch Management to Reduce Greenhouse Gas Emissions Associated with Agricultural Runoff
8	Extending Climate Change Programming

**Outcome #1**

**1. Outcome Measures**

(2.1a) Number of consumers, residents, agricultural/ natural resources producers, organization and business representatives, and/or local government and community leaders who demonstrate knowledge gains about on the causes and implications of climate change and adaptive or mitigating strategies.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	1242

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
104	Protect Soil from Harmful Effects of Natural Elements
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
125	Agroforestry
132	Weather and Climate
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife
136	Conservation of Biological Diversity
141	Air Resource Protection and Management
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants



**Outcome #2**

**1. Outcome Measures**

(2.1b) Number of agricultural/ natural resources producers, organization and business representatives documented to have adopted recommended adaptation strategies for production agriculture and natural resources management, including invasive species, pest management, pollutant loads, wetlands, etc.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	5411

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
111	Conservation and Efficient Use of Water
132	Weather and Climate
133	Pollution Prevention and Mitigation
405	Drainage and Irrigation Systems and Facilities

**Outcome #3**

**1. Outcome Measures**

(2.1c) Number of agencies/ organizations/ communities documented to have adopted recommended climate mitigation practices and policies.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	41

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
132	Weather and Climate

**Outcome #4**

**1. Outcome Measures**

(2.2a) Number of consumers, residents, agricultural/ natural resources producers, organization and business representatives, and/or local government and community leaders documented to have modified existing practices or technologies and/or adopted new practices to protect/enhance water resources.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	6271

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
104	Protect Soil from Harmful Effects of Natural Elements
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management

**Outcome #5**

**1. Outcome Measures**

(2.2b) Number of documented instances when consumers, residents, agricultural/ natural resources producers, organization and business representatives, and/or local government and community leaders have improved and/or protected water resources.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	5779

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
104	Protect Soil from Harmful Effects of Natural Elements
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management

**Outcome #6**

**1. Outcome Measures**

(2.3a) Number of consumers, residents, agricultural/ natural resources producers, organization and business representatives, and/or local government and community leaders documented to have modified existing practices or technologies and/or adopted new practices to protect/enhance natural resources and/or enhance biodiversity.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	7337

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
104	Protect Soil from Harmful Effects of Natural Elements
111	Conservation and Efficient Use of Water
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants

**Outcome #7**

**1. Outcome Measures**

Improving Roadside Ditch Management to Reduce Greenhouse Gas Emissions Associated with Agricultural Runoff

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Nitrogen pollution, largely from agricultural fertilizers, is both a major source of pollution to aquatic ecosystems and a source of the potent greenhouse gas nitrous oxide (N<sub>2</sub>O). Excess nitrogen in aquatic systems is a leading driver of algal blooms, dead zones, and fisheries decline. In the atmosphere, N<sub>2</sub>O is estimated to have 300 times the impact of CO<sub>2</sub> and is third on the list of greenhouse gasses responsible for climate change. Roadside ditch networks have been identified as conduits for other pollutants between agricultural fields and streams, yet uncertainty remains regarding how nitrogen is transported and transformed across landscapes.

**What has been done**

The project (NYC-147411) included field and lab experiments that were designed to uncover the role of roadside ditches in the transport and transformation of nitrogen runoff from farms. Dr. Rebecca Schneider and her team investigated temporal changes in the quantity and type of nitrogen flowing through ditches and how they are affected by seasonal changes in agricultural

activities and weather. Additionally, researchers measured flux rates from ditches under different management practices and evaluated the efficacy of woodchip bioreactors as a mitigation technique to reduce N2O emissions and flow of dissolved nitrogen. Extension activities were designed to communicate ditch management strategies to stakeholders.

**Results**

The Cornell Roadside Ditch program has been underway for more than a decade and is a shining example of integrated research and extension. In the current project, field experiments confirmed that agricultural practices are a major source of dissolved nitrogen, which is efficiently transported to nearby streams via the ditch network. The research team also measured highly variable emission rates of N2O gas, indicating that denitrification is occurring in ditch substrates under certain conditions, including both complete denitrification to N2 as well production of the greenhouse gas N2O. Given the high flow rates of dissolved nitrogen, researchers tested an in-ditch woodchip bioreactor as a strategy for removing significant quantities of nitrogen with the hope of improving water quality in connected streams. The pilot test was successful, with up to 80% nitrogen removal, and justifies more research to determine its potential use as part of a ditch-based, watershed-wide filtration system.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
101	Appraisal of Soil Resources
104	Protect Soil from Harmful Effects of Natural Elements
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

**Outcome #8**

**1. Outcome Measures**

Extending Climate Change Programming

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	0

**3c. Qualitative Outcome or Impact Statement**

### **Issue (Who cares and Why)**

Climate data for the last 50 years show dramatic changes in temperature and precipitation at the global, national, regional, and state levels. In New York and elsewhere, global climate change is believed responsible for more erratic weather patterns, warmer temperatures, heavier rainfall, lower snow levels, and altered season length with intensifying impact on humans, wildlife, the economy, and the environment. This project addresses needs by integrating new research-based materials and decision-making tools from the newly formed CCE Climate Smart Farming (CSF) program into outreach programs for New York audiences, primarily agricultural stakeholders.

### **What has been done**

The program conducted outreach at numerous staff training events and conferences resulting in CCE staff are integrating CSF training and resources into their events. There were 88 extension events held in 2016, reaching 6,866 participants. With the help of our Climate Smart Farming Extension Team, four farmer focus groups on climate change were organized in 2016 in collaboration with the USDA NE Climate Hub to learn from stakeholders the key risks they are experiencing, and adaptation practices they are adopting. The tools launched and improved in 2016 included: a new Growing Degree Day Calculator that incorporates climate change into the model; new Freeze Risk Tool for grapes that provides a warning to farmers; and an innovative new water deficit calculator.

### **Results**

Focus group interviews affirm that New York farmers and communities are facing new challenges with increasing extreme weather, variability, and climate change. Farmers have indicated they need more specific information on "what to do now?" to respond to this challenge and seize opportunities they need access to new research-based information and tools that are built for their commodities and their location, in order to stay competitive in this changing climate. Cornell's new Climate Smart Farming Program builds the capacity of the Cornell Cooperative Extension system to provide climate change and agricultural information, tools, and best management practices to help farmers and communities adapt and mitigate climate change. In 2016 over 5,400 program participants indicated that they have adopted recommended adaptation strategies for production agriculture and natural resources management. This project will continue to grow adaptation for continued agricultural success in a changing climate with the use of the climate smart farming tools.

## **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
104	Protect Soil from Harmful Effects of Natural Elements
111	Conservation and Efficient Use of Water
133	Pollution Prevention and Mitigation
902	Administration of Projects and Programs

## V(H). Planned Program (External Factors)

### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

### Brief Explanation

Climate change issues play out in a complex and volatile context involving weather extremes, changing governmental policies and regulations, competitive land uses and shifting development patterns, evolving consumer demands, and globally influenced markets. The specific implications of these external factors vary greatly by locale and across commodities and business forms. Technical knowledge of climate change issues and mitigation strategies is evolving rapidly. Flooding events during recent years continues to elevate consumer and community interest in disaster preparedness and water quality protection for families, communities and farms. The shift in interest, program offerings and campus and research support is evident. These trends are expected to continue.

## V(I). Planned Program (Evaluation Studies)

### Evaluation Results

Each of the plans addresses a broad combination of applied research and extension initiatives spanning multiple audiences, methods, and intended outcomes. A combination of routine program monitoring and documentation, near-term outcome assessment, and targeted follow-up activities are expected to provide a comprehensive assessment. We work towards this goal by doing two things - professional development to enhance evaluation capacity of our system and collecting quantitative and qualitative documentation of local, regional and statewide programs.

**Evaluation Capacity Building:** Cornell Cooperative Extension has worked with the Cornell Office of Research on Evaluation (CORE) to strengthen evaluation practice and build evaluation capacity. CORE developed The Systems Evaluation Protocol that takes programs from logic models (columnar) to pathway models (a visual model that shows the relationship of short-term, mid-term and long-term outcomes) and helps to create an evaluation strategy. CORE tested and refined The Systems Evaluation Protocol in partnership with CCE programs from 2006 - 2015. The Protocol has been integrated into professional development in CCE, to promote consistent approaches to evaluation of county-based, regional, and statewide programs. Although the formal project connection with CORE ended in 2015, access to the Netway and online training continues to be available. Additionally, CCE program leaders are being trained in logic and pathway modeling through the CCE Program Development Leadership Cohort, an in-depth and comprehensive professional development experience targeting program leaders to become more proficient at program planning and evaluation.



**Regional/Statewide documentation examples.** Many regional and statewide programs are receiving federal capacity funds. Documentation of outcomes is a requirement of funding. Results shape future program efforts and impact program design. **An example evaluation from a funded project can be found below.**

**There is also a requirement for our local and regional programs to report on statewide outcomes/indicators:** Program documentation results are aggregated in a statewide accountability database that includes both qualitative and quantitative data for reporting and helping us to better understand impacts. Quantitative system-wide outcome data is reported in the outcome portion of this report.

### Key Items of Evaluation

Example evaluation - Cover Crops for Sustainability (Matthew Ryan) - use online survey

The goal of this project was to increase cover crop utilization in agronomic crops. The focus was on organic farming systems, but results are transferable to all farms growing corn and soybeans.

An online survey was conducted to better understand the approaches/methods needs of farmers who use cover crops and the potential opportunities that exist for cover crop breeding. Demographic data and information on farmer management practices and farmer perspectives on winter annual cover crop traits were collected. Of the 417 responses received from farmers over the one-month active period of the survey, 87% reported that they used cover crops. Organic farmers were targeted for distribution of this survey, which resulted in 67% of the respondents reporting that they farmed organic land. Respondents represented a wide diversity of states, farm sizes, plant hardiness zones, and cash crops produced. Results from the survey provide insight into the practical challenges of growing cover crops and farmers' perspectives on opportunities for breeding to play a role in addressing limitations with cover crop performance. Respondents reported strong support for cover crop research and participatory breeding. Results illustrate substantial interest from farmers for more research on cover crop breeding and indicate opportunities for variety improvement and cover crop seed market development. An organic farmer advisory board also evaluated activities. Feedback from this group helped fine-tune the program.

On-farm and research station experiments have demonstrated high yields organic no-till soybean. Rye and triticale cover crops showed the best potential in this system. Several organic farmers in New York State have adopted practices developed as part of this project. These innovators have been very instrumental in spreading the word to other farmers and contributing to farmer-to-farmer learning. Farmers have reported that they are trying rolled cover crops for not only soybean, but also other crops including pumpkins. Crop performance and ecosystem services of this cropping system, as well as its reliability under increasingly common weather extremes will continue to be investigated as well as the combination of rolled cover crops with interseeded cover crops in a rotation.

Results were disseminated to farmers, extension educators, and students through a variety of means including field days, workshops, newsletter articles, conference presentations, and website posts.

More detail about this project can be found at:

- <https://scs.cals.cornell.edu/people/matthew-ryan>

**V(A). Planned Program (Summary)**

**Program # 3**

**1. Name of the Planned Program**

Environment and Natural Resources and Sustainable Energy

Reporting on this Program

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
123	Management and Sustainability of Forest Resources	18%		0%	
124	Urban Forestry	10%		5%	
205	Plant Management Systems	0%		48%	
308	Improved Animal Products (Before Harvest)	0%		3%	
401	Structures, Facilities, and General Purpose Farm Supplies	14%		0%	
402	Engineering Systems and Equipment	8%		5%	
403	Waste Disposal, Recycling, and Reuse	25%		18%	
404	Instrumentation and Control Systems	5%		2%	
511	New and Improved Non-Food Products and Processes	0%		13%	
605	Natural Resource and Environmental Economics	20%		3%	
609	Economic Theory and Methods	0%		3%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	64.0	0.0	7.0	0.0
<b>Actual Paid</b>	87.1	0.0	5.0	0.0
<b>Actual Volunteer</b>	2787.0	0.0	0.0	0.0

2. Institution Name: Cornell University

Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
867741	0	435286	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
867741	0	939259	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**2. Institution Name:** NY State Agricultural Experiment Station

**Actual dollars expended in this Program (includes Carryover Funds from previous years)**

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	69179	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	92436	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

This is a program entailing a wide range of applied research activities and multiple education methods depending on local context and need. Campus-based faculty and extension associates, regional specialists and county-based educators all are involved in designing, implementing, and evaluating tailored applied research and educational efforts depending on the focus and scope of their role.

Topics include: Waste management, wildlife management and forestry, renewable energy resources, energy conservation and efficiency, heating with wood, forestry etc.

Sample Statewide/Regional Initiatives that fall within this Plan of Work

- Consumer Education Program for Residential Energy Efficiency
- Energy Education in Camp
- Farm Energy Audits
- Farm Waste Management
- Green Building Seminar Series
- Maple Program
- Master Composters
- Master Forest Owners
- Master Naturalist

- Private Forest Stewardship Program
- Recycling Ag Plastics
- Save Energy, Save Dollars
- Urban Forestry

## 2. Brief description of the target audience

- Key audiences served, directly and indirectly include: agricultural and natural resource producers; consumers and property owners, businesses and organizations, teachers, youth professionals and volunteers, local/state/federal governmental leaders.
- Businesses, organizations, and producers are targeted with information about improved management practices and alternative land uses, such as agroforestry. Environmental planners and managers and technical assistance providers, such as foresters, are targeted with in-depth information related to their audiences/constituents. Teachers, youth professionals and volunteers are targeted with in-depth knowledge for youth enrichment.
- Agricultural/horticulture/natural resource and supporting businesses are targeted both regarding bioenergy production opportunities and information regarding alternative energy sources and conservation. Consumers are targeted for information regarding energy supply alternatives and energy conservation options for residential, facilities, and transportation needs.
- Residents and property owners are targeted with stewardship and waste reduction and management in their homes and on their properties. Businesses, organizations, and producers are targeted with information about reducing impacts of their operations. Teachers and youth professionals and volunteers are provided with curriculum and training. Youth are targeted with age appropriate education.

## 3. How was eXtension used?

Cornell Cooperative Extension supports and promotes eXtension communities of practice, the eXtension public site and the professional development offered through eXtension.org. Staff across the state are encouraged to be involved in appropriate COPs, and the link to eXtension is promoted on the front page of the Cornell Cooperative Extension public staff site. Currently 350 staff are registered, 156 are active users of eXtension, 28 of which are faculty members. Staff have cited the usefulness of COPs - particularly where there are identified national projects - such as with Financial Security for All COP.

Examples of involvement include:

- **Jeff Piestrak**, Outreach Specialist for Mann Library at Cornell, is working with faculty and staff at Cornell, several other LGUs and NIFA to implement recommendations following a research fellowship on **Land Grant Informatics** co-sponsored by eXtension. A focus is making data and information resources more discoverable, shareable and usable in support of Extension programming and impact. That includes a new cross-disciplinary Local & Regional Food Systems initiative at Cornell led by faculty member Anu Rangarajan modeled after and connected to similar efforts at other institutions like MSU and Virginia Tech. Some initial support is being offered by eXtension with additional funding sources being explored.
- **Heidi Mouillesseaux-Kunzman**, Senior Extension Associate with the Community and Regional Development Institute, Development Sociology, co-leads the **Enhancing Rural Community Capacity** Community of Practice. A key focus of the ERCC CoP over the last year is further developing Foundations of Practice, a national training program targeted to community developers. The CoP was selected to participate in eXtension's 2016 Community Issues Corps Designathon to help move this initiative forward.
- **Keith Tidball**, Senior Extension Associate in the Department of Natural Resources and Assistant Director of Cornell Cooperative Extension leads the **Community Capacity Building concentration area of the Military Families Learning Network**, and also serves as a delegate and New York State program lead of the **Extension Disaster Education Network**. Both eXtension networks evolved from eXtension communities of practice.

Examples of participation in COPs in this plan of work area include:

- Climate, Forests and Woodlands
- Consumer Horticulture
- Diversity Equity and Inclusion
- Forest Farming
- Home Energy
- Pesticide Environmental Stewardship
- Sustainability Education
- Sustainable Ag Energy
- Wildlife Damage Management
- Wood Energy

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	223493	11871236	28138	1494601

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

Year: 2016  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
<b>Actual</b>	0	56	56

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- {No Data Entered}

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	(3.1a) Number of producers, economic development organizations and other groups who collaborate to establish bioenergy as a viable alternative crop.
2	(3.1b) Number of existing or new producers documented to have modified existing practices or technologies and/or adopted best management practices for bioenergy production, harvesting, and/or storage systems.
3	(3.1c) Number of producers, horticulture businesses and/or natural resource managers reporting that cropping for and/or use of bioenergy leads to increased economic returns to their enterprises.
4	(3.2a) Number of agricultural/horticultural/ natural resource businesses documented to have adopted appropriate alternative energy sources and/or energy conservation practices.
5	(3.2b) Number of producers/horticulture businesses/natural resource managers documented to have improved economic returns to agricultural/ horticultural business profitability and vitality resulting from adopting alternative energy sources and/or energy conservation.
6	(3.3a) Number of consumers documented to have adopted appropriate alternative energy sources.
7	(3.3b) Number of consumers who report savings on energy costs attributable to adopting alternative energy sources.
8	(3.4a) Number of consumers reporting to have adopted appropriate energy cost control and/or conservation practices.
9	(3.4b) Number of property managers, and/or housing officials documented to have taken measures to improve energy cost control or efficiency of existing and new buildings.
10	(3.4c) Number of consumers who report savings on energy costs attributable to adopting energy conservation measures.
11	(3.5a) Number of communities documented to have assessed local energy development proposals and/or the relationships between current policies and regulations and energy conservation.
12	(3.5b) Number of community agencies/ organizations documented to have adopted appropriate alternative energy sources.
13	(3.5c) Number of communities that adapt or revise policies in response to large scale energy development (e.g., Marcellus shale development) and/or include energy as a component of their comprehensive plans.
14	(3.5d) Number of communities documented to have established or modified land use and development policies to promote energy conservation.
15	(3.5e) Number of community agencies/organizations reporting savings on energy costs attributable to adopting alternative energy sources.
16	(3.6a) Number of agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents who demonstrate knowledge gains about waste management and reduction.
17	(3.6b) Number of agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents documented to have modified existing

	practices or technologies and/or adopted new practices to manage and reduce waste.
18	(3.6c) Number of agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents documented to have reduced costs through improved waste management practices.
19	(3.7a) Number of agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents documented to have modified existing practices or technologies that will assist with natural resources management and the environment.

**Outcome #1**

**1. Outcome Measures**

(3.1a) Number of producers, economic development organizations and other groups who collaborate to establish bioenergy as a viable alternative crop.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	9

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse
404	Instrumentation and Control Systems
605	Natural Resource and Environmental Economics



**Outcome #2**

**1. Outcome Measures**

(3.1b) Number of existing or new producers documented to have modified existing practices or technologies and/or adopted best management practices for bioenergy production, harvesting, and/or storage systems.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	22

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse
404	Instrumentation and Control Systems
605	Natural Resource and Environmental Economics

**Outcome #3**

**1. Outcome Measures**

(3.1c) Number of producers, horticulture businesses and/or natural resource managers reporting that cropping for and/or use of bioenergy leads to increased economic returns to their enterprises.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	18

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
123	Management and Sustainability of Forest Resources
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse
404	Instrumentation and Control Systems
605	Natural Resource and Environmental Economics

**Outcome #4**

**1. Outcome Measures**

(3.2a) Number of agricultural/horticultural/ natural resource businesses documented to have adopted appropriate alternative energy sources and/or energy conservation practices.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	84

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse
404	Instrumentation and Control Systems
605	Natural Resource and Environmental Economics

**Outcome #5**

**1. Outcome Measures**

(3.2b) Number of producers/horticulture businesses/natural resource managers documented to have improved economic returns to agricultural/ horticultural business profitability and vitality resulting from adopting alternative energy sources and/or energy conservation.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	43

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse
404	Instrumentation and Control Systems
605	Natural Resource and Environmental Economics

**Outcome #6**

**1. Outcome Measures**

(3.3a) Number of consumers documented to have adopted appropriate alternative energy sources.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	385

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
605	Natural Resource and Environmental Economics

**Outcome #7**

**1. Outcome Measures**

(3.3b) Number of consumers who report savings on energy costs attributable to adopting alternative energy sources.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	327

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
605	Natural Resource and Environmental Economics

**Outcome #8**

**1. Outcome Measures**

(3.4a) Number of consumers reporting to have adopted appropriate energy cost control and/or conservation practices.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	588

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
124	Urban Forestry
403	Waste Disposal, Recycling, and Reuse
605	Natural Resource and Environmental Economics

**Outcome #9**

**1. Outcome Measures**

(3.4b) Number of property managers, and/or housing officials documented to have taken measures to improve energy cost control or efficiency of existing and new buildings.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	21

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
403	Waste Disposal, Recycling, and Reuse
404	Instrumentation and Control Systems
605	Natural Resource and Environmental Economics

**Outcome #10**

**1. Outcome Measures**

(3.4c) Number of consumers who report savings on energy costs attributable to adopting energy conservation measures.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	706

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
124	Urban Forestry
403	Waste Disposal, Recycling, and Reuse

**Outcome #11**

**1. Outcome Measures**

(3.5a) Number of communities documented to have assessed local energy development proposals and/or the relationships between current policies and regulations and energy conservation.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	7

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
124	Urban Forestry
403	Waste Disposal, Recycling, and Reuse

**Outcome #12**

**1. Outcome Measures**

(3.5b) Number of community agencies/ organizations documented to have adopted appropriate alternative energy sources.

**2. Associated Institution Types**



- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	6

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
605	Natural Resource and Environmental Economics

**Outcome #13**

**1. Outcome Measures**

(3.5c) Number of communities that adapt or revise policies in response to large scale energy development (e.g., Marcellus shale development) and/or include energy as a component of their comprehensive plans.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	22

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
124	Urban Forestry

**Outcome #14**

**1. Outcome Measures**

(3.5d) Number of communities documented to have established or modified land use and development policies to promote energy conservation.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	7

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
123	Management and Sustainability of Forest Resources
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment

**Outcome #15**

**1. Outcome Measures**

(3.5e) Number of community agencies/organizations reporting savings on energy costs attributable to adopting alternative energy sources.

**2. Associated Institution Types**

- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	2

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
605	Natural Resource and Environmental Economics

**Outcome #16**

**1. Outcome Measures**

(3.6a) Number of agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents who demonstrate knowledge gains about waste management and reduction.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	3040

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse
404	Instrumentation and Control Systems

**Outcome #17**

**1. Outcome Measures**

(3.6b) Number of agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents documented to have modified existing practices or technologies and/or adopted new practices to manage and reduce waste.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	213

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse
404	Instrumentation and Control Systems

**Outcome #18**

**1. Outcome Measures**

(3.6c) Number of agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents documented to have reduced costs through improved waste management practices.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	1904

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
401	Structures, Facilities, and General Purpose Farm Supplies
402	Engineering Systems and Equipment
403	Waste Disposal, Recycling, and Reuse
404	Instrumentation and Control Systems

**Outcome #19**

**1. Outcome Measures**

(3.7a) Number of agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents documented to have modified existing practices or technologies that will assist with natural resources management and the environment.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	1197

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
605	Natural Resource and Environmental Economics

## **V(H). Planned Program (External Factors)**

### **External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

### **Brief Explanation**

The interaction between natural disasters, the economy, energy and waste management costs is well documented. Weather in particular has interrupted supplies and dramatically influences heating and cooling costs. Appropriations, public policy, and regulations directly affect the ability to pursue energy source alternatives, including bioenergy development, and to implement energy conservation alternatives--particularly for low-income households. Dramatic cuts in state funding for consumer energy education is a significant barrier. Public and private funding groups and CCE may have fewer fiscal resources and other resources to devote to energy and natural resource protection matters. These trends are expected to continue.

The scope and scale of outcomes is greatly enhanced by augmenting Federal Capacity Funds with external sources of support. However, external grant funds may only support certain activities or aspects of this plan. Local governments, an important funding source for local extension staff, face diminished revenues and increased mandated costs outside of the non-mandated extension programs. Thus having professionals available to implement new research-based programming is not always possible.

## **V(I). Planned Program (Evaluation Studies)**

### **Evaluation Results**

Each of the plans addresses a broad combination of applied research and extension initiatives spanning multiple audiences, methods, and intended outcomes. A combination of routine program monitoring and documentation, near-term outcome assessment, and targeted follow-up activities are expected to provide a comprehensive assessment. We work towards this goal by doing two things - professional development to enhance evaluation capacity of our system and collecting quantitative and qualitative documentation of local, regional and statewide programs.

**Evaluation Capacity Building:** Cornell Cooperative Extension has worked with the Cornell Office of Research on Evaluation (CORE) to strengthen evaluation practice and build evaluation capacity. CORE developed The Systems Evaluation Protocol that takes programs from logic models (columnar) to pathway models (a visual model that shows the relationship of short-term, mid-term and long-term outcomes) and helps to create an evaluation strategy. CORE tested and refined The Systems Evaluation Protocol in partnership with CCE programs from 2006 - 2015. The Protocol has been integrated into

professional development in CCE, to promote consistent approaches to evaluation of county-based, regional, and statewide programs. Although the formal project connection with CORE ended in 2015, access to the Netway and online training continues to be available. Additionally, CCE program leaders are being trained in logic and pathway modeling through the CCE Program Development Leadership Cohort, an in-depth and comprehensive professional development experience targeting program leaders to become more proficient at program planning and evaluation.

**Regional/Statewide documentation examples.** Many regional and statewide programs are receiving federal capacity funds. Documentation of outcomes is a requirement of funding. Results shape future program efforts and impact program design. **An example evaluation from a funded project can be found below.**

**There is also a requirement for our local and regional programs to report on statewide outcomes/indicators:** Program documentation results are aggregated in a statewide accountability database that includes both qualitative and quantitative data for reporting and helping us to better understand impacts. Quantitative system-wide outcome data is reported in the outcome portion of this report.

## Key Items of Evaluation

Example evaluation for- Energy and IEQ (Joseph Laquatra) - use of post survey:

Cornell Cooperative Extension, through the Department of Design and Environmental Analysis, trained trainers and individuals in no-cost/low-cost energy-saving practices. Limited resource households were targeted through EmPower New York and learned no-cost/low-cost energy-saving practices in workshops and other events.

Extension Educators trained 15,229 participants throughout New York State and New York City in basics of residential energy efficiency at Save Energy - Save Dollars (EmPower) workshops. EmPower workshop participants completed NYSERDA-provided Action Plans. Every participant indicated actions to be taken, from changing to more efficient light bulbs to participating in the Home Performance with Energy Star program. A core recommendation made during EmPower workshops is that homeowners and renters participate in the Home Performance with ENERGY STAR program. This program features a thorough energy audit, conducted by a trained technician, and improvements to energy efficiency based on audit findings.

A survey of workshop participants indicated that 69% people reached via workshops followed up with an energy audit. Research has documented the following impacts from Home Performance with ENERGY STAR in a cold climate: 20 - 30% reduction in energy use per home; average electricity savings of 1,298 kWh (12%); average oil or gas savings of 270 therms (22%); and average cash savings of \$400 per year. These figures when used to calculate cash and energy savings, as well as the resulting reduction in CO2 emissions as follows:

- Projected Impacts from EmPower Workshops per year Electricity Savings (kWh): 15,473,458
- Oil or Gas Savings (therms): 3,218,670 Cash Savings (\$): 4,768,400

The results represent a reduction in CO2 emissions of 5,571 pounds per person (or 2.53



metric tons) from participation in EmPower workshops. According to the U.S. Department of Energy emissions per capita in the U.S. average 19.78 metric tons. The 2.53 metric ton figure represents 13% of the average American per capita emission. The assumptions used in this analysis are conservative. Reductions are likely to contribute to goals of the Regional Greenhouse Gas Initiative, of which New York is a participating state.

More detail about this project can be found at:

- <http://www.human.cornell.edu/bio.cfm?netid=jl27>

**V(A). Planned Program (Summary)**

**Program # 4**

**1. Name of the Planned Program**

Nutrition, Food Safety and Security, and Obesity Prevention

Reporting on this Program

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

<b>KA Code</b>	<b>Knowledge Area</b>	<b>%1862 Extension</b>	<b>%1890 Extension</b>	<b>%1862 Research</b>	<b>%1890 Research</b>
303	Genetic Improvement of Animals	0%		4%	
311	Animal Diseases	0%		19%	
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals	0%		1%	
315	Animal Welfare/Well-Being and Protection	0%		5%	
502	New and Improved Food Products	3%		5%	
603	Market Economics	0%		2%	
607	Consumer Economics	2%		0%	
701	Nutrient Composition of Food	11%		8%	
702	Requirements and Function of Nutrients and Other Food Components	8%		7%	
703	Nutrition Education and Behavior	33%		2%	
704	Nutrition and Hunger in the Population	5%		2%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	5%		4%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	8%		15%	
721	Insects and Other Pests Affecting Humans	0%		3%	
722	Zoonotic Diseases and Parasites Affecting Humans	0%		3%	
723	Hazards to Human Health and Safety	0%		4%	
724	Healthy Lifestyle	25%		8%	
903	Communication, Education, and Information Delivery	0%		8%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

**1. Actual amount of FTE/SYs expended this Program**

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	190.0	0.0	9.0	0.0
<b>Actual Paid</b>	212.3	0.0	7.0	0.0
<b>Actual Volunteer</b>	12066.0	0.0	0.0	0.0

**2. Institution Name:** Cornell University

**Actual dollars expended in this Program (includes Carryover Funds from previous years)**

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
2114725	0	1160928	0
<b>1862 Matching</b>	<b>1890 Matching</b>	<b>1862 Matching</b>	<b>1890 Matching</b>
2114725	0	2172668	0
<b>1862 All Other</b>	<b>1890 All Other</b>	<b>1862 All Other</b>	<b>1890 All Other</b>
0	0	0	0

**2. Institution Name:** NY State Agricultural Experiment Station

**Actual dollars expended in this Program (includes Carryover Funds from previous years)**

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	28955	0
<b>1862 Matching</b>	<b>1890 Matching</b>	<b>1862 Matching</b>	<b>1890 Matching</b>
0	0	59734	0
<b>1862 All Other</b>	<b>1890 All Other</b>	<b>1862 All Other</b>	<b>1890 All Other</b>
0	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

Programs for children and youth are delivered through a variety of settings: 4-H camps, clubs, fairs and afterschool as well as through child-parent/grandparent involvement projects and in-school student education. Family-focused programs promote a positive parent/care-giver/child feeding relationship and an understanding of age appropriate nutrition and physical activity. Extension staff collaborate with community leaders to improve the local environments for healthy eating and active living. Activities include sequential learning events, "community workshops" and engagement with community and civic leaders to improve

the environment for nutrition and wellness and support of the local food system.

Food safety activities provide educational programs in collaboration with regulatory agencies involved with assuring the safety and wholesomeness of food grown, processed, prepared, sold and handled and consumed by the public in New York State. They are delivered via courses, presentations and educational materials, support transfer of new research-based information for appropriate applications in the agricultural production, manufacturing, retailing and food service industries.

## 2. Brief description of the target audience

Childhood obesity prevention program audiences reached include: low-income families; 4-H youth; children in and out of school; nutrition and health professionals; school food service staff; community leaders; and government and agency leaders at the local, state, and national levels.

Food security program audiences reached include: low-income individuals and families; caregivers, nutritionists, community leaders, human service providers and food policy makers at the local, state, and national levels.

Food safety program audiences reached include: produce growers; dairy farmers; food processors; producers and consumers with targeted programs for low- and moderate- income families; 4-H youth; nutrition and health professionals; food service and food production staff and their managers and directors; and government and agency leaders at the local, state, and national levels.

## 3. How was eXtension used?

Cornell Cooperative Extension supports and promotes eXtension communities of practice, the eXtension public site and the professional development offered through eXtension.org. Staff across the state are encouraged to be involved in appropriate COPs, and the link to eXtension is promoted on the front page of the Cornell Cooperative Extension public staff site. Currently 350 staff are registered, 156 are active users of eXtension, 28 of which are faculty members. Staff have cited the usefulness of COPs - particularly where there are identified national projects - such as with Financial Security for All COP.

Examples of involvement include:

- **Jeff Piestrak**, Outreach Specialist for Mann Library at Cornell, is working with faculty and staff at Cornell, several other LGUs and NIFA to implement recommendations following a research fellowship on **Land Grant Informatics** co-sponsored by eXtension. A focus is making data and information resources more discoverable, shareable and usable in support of Extension programming and impact. That includes a new cross-disciplinary Local & Regional Food Systems initiative at Cornell led by faculty member Anu Rangarajan modeled after and connected to similar efforts at other institutions like MSU and Virginia Tech. Some initial support is being offered by eXtension with additional funding sources being explored.
- **Heidi Mouillesseaux-Kunzman**, Senior Extension Associate with the Community and Regional Development Institute, Development Sociology, co-leads the **Enhancing Rural Community Capacity** Community of Practice. A key focus of the ERCC CoP over the last year is further developing Foundations of Practice, a national training program targeted to community developers. The CoP was selected to participate in eXtension's 2016 Community Issues Corps Designathon to help move this initiative forward.
- **Keith Tidball**, Senior Extension Associate in the Department of Natural Resources and Assistant Director of Cornell Cooperative Extension leads the **Community Capacity Building concentration area of the Military Families Learning Network**, and also serves as a delegate and New York State program lead of the **Extension Disaster Education Network**. Both eXtension networks evolved from eXtension communities of practice.

Examples of participation in COPs in this plan of work area include:

2016 Cornell University Research and Extension and NY State Agricultural Experiment Station Research Combined Annual Report of Accomplishments and Results

- Community Nutrition Education
- Creating Healthy Communities
- Diversity Equity and Inclusion
- Families, Food and Fitness
- Food and Fitness
- Healthy Food Choices in Schools

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	416728	9590169	421143	9691771

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

Year: 2016  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
<b>Actual</b>	4	180	184

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- {No Data Entered}

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	(4.1a) Number of children and youth who demonstrate knowledge or skill gains related to healthy eating and active living
2	(4.1b) Number parents/ caregivers and other adults who demonstrate knowledge or skill gains related to healthy eating and active living.
3	(4.1c) Number of youth program participants documented to have applied healthy eating and/or active living, recommendations
4	(4.1d) Number of adult program participants documented to have applied healthy eating and/or active living, recommendations
5	(4.2a) Number of program participants who adopt food resource management and/or food security practices
6	(4.2b) Number of program participants documented to have improved food resource management and/or food security
7	(4.3a) Number of program participants documented to have increased involvement in public/community childhood obesity prevention actions
8	(4.3b) Number of participating schools and/or communities documented to have made practice and/or policy changes to promote healthy eating and active living
9	(4.4a) Number of program participants who have acted to improve their food security status.
10	(4.4b) Number of community action plans implemented as a result of community based assessment.
11	(4.4c) Number of individuals or households documented to have improved food security status.
12	(4.5a) Number of consumers who demonstrate knowledge or skill gains related to reducing food safety and/or foodborne risks and illnesses including recommended purchasing, handling, storage, and preparation practices.
13	(4.5b) Number of consumers documented to have implemented new and/or increased application of ongoing safe food purchasing, handling, storage, and preparation practices.
14	(4.6a) Number of producers/ processors/food service providers documented to have implemented new and/or increased application of ongoing safe food production, processing, storage, handling, marketing, and preparation practices.
15	(4.7a) Number of communities/ firms/or organizations documented to have assessed practices or food safety policies as a result of participating in relevant educational programs.
16	(4.7b) Number of communities/ firms/or organizations documented to have implemented improved practices or food safety policies as a result of participating in relevant educational programs.
17	Expanded Food and Nutrition Education Program

## **Outcome #1**

### **1. Outcome Measures**

(4.1a) Number of children and youth who demonstrate knowledge or skill gains related to healthy eating and active living

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	77588

### **3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
701	Nutrient Composition of Food
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
724	Healthy Lifestyle

## **Outcome #2**

### **1. Outcome Measures**

(4.1b) Number parents/ caregivers and other adults who demonstrate knowledge or skill gains related to healthy eating and active living.

## 2. Associated Institution Types

- 1862 Extension
- 1862 Research

### 3a. Outcome Type:

Change in Action Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2016	88442

### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

**What has been done**

**Results**

## 4. Associated Knowledge Areas

KA Code	Knowledge Area
701	Nutrient Composition of Food
703	Nutrition Education and Behavior
724	Healthy Lifestyle

## Outcome #3

### 1. Outcome Measures

(4.1c) Number of youth program participants documented to have applied healthy eating and/or active living, recommendations

### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

### 3a. Outcome Type:

Change in Action Outcome Measure



**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	48257

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
701	Nutrient Composition of Food
703	Nutrition Education and Behavior
724	Healthy Lifestyle

**Outcome #4**

**1. Outcome Measures**

(4.1d) Number of adult program participants documented to have applied healthy eating and/or active living, recommendations

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	53714

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

## Results

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
701	Nutrient Composition of Food
703	Nutrition Education and Behavior

### Outcome #5

#### 1. Outcome Measures

(4.2a) Number of program participants who adopt food resource management and/or food security practices

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

#### 3a. Outcome Type:

Change in Condition Outcome Measure

#### 3b. Quantitative Outcome

Year	Actual
2016	54106

#### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

**What has been done**

**Results**

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
701	Nutrient Composition of Food
703	Nutrition Education and Behavior

**Outcome #6**

**1. Outcome Measures**

(4.2b) Number of program participants documented to have improved food resource management and/or food security

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	27147

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
703	Nutrition Education and Behavior
724	Healthy Lifestyle

**Outcome #7**

**1. Outcome Measures**

(4.3a) Number of program participants documented to have increased involvement in public/community childhood obesity prevention actions

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	18922

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
701	Nutrient Composition of Food
703	Nutrition Education and Behavior
724	Healthy Lifestyle

**Outcome #8**

**1. Outcome Measures**

(4.3b) Number of participating schools and/or communities documented to have made practice and/or policy changes to promote healthy eating and active living

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	202

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
701	Nutrient Composition of Food
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
724	Healthy Lifestyle

**Outcome #9**

**1. Outcome Measures**

(4.4a) Number of program participants who have acted to improve their food security status.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	11718

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
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**Outcome #10**

**1. Outcome Measures**

(4.4b) Number of community action plans implemented as a result of community based assessment.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	12

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components

**Outcome #11**

**1. Outcome Measures**

(4.4c) Number of individuals or households documented to have improved food security status.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	6794

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
702	Requirements and Function of Nutrients and Other Food Components

**Outcome #12**

**1. Outcome Measures**

(4.5a) Number of consumers who demonstrate knowledge or skill gains related to reducing food safety and/or foodborne risks and illnesses including recommended purchasing, handling, storage, and preparation practices.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	39334

### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

**What has been done**

**Results**

### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
703	Nutrition Education and Behavior
724	Healthy Lifestyle

### Outcome #13

#### 1. Outcome Measures

(4.5b) Number of consumers documented to have implemented new and/or increased application of ongoing safe food purchasing, handling, storage, and preparation practices.

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

#### 3a. Outcome Type:

Change in Action Outcome Measure

#### 3b. Quantitative Outcome

<b>Year</b>	<b>Actual</b>
2016	8125

### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

**What has been done**

**Results**

### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
502	New and Improved Food Products
703	Nutrition Education and Behavior



**Outcome #14**

**1. Outcome Measures**

(4.6a) Number of producers/ processors/food service providers documented to have implemented new and/or increased application of ongoing safe food production, processing, storage, handling, marketing, and preparation practices.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	399

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
502	New and Improved Food Products
703	Nutrition Education and Behavior
724	Healthy Lifestyle

**Outcome #15**

**1. Outcome Measures**

(4.7a) Number of communities/ firms/or organizations documented to have assessed practices or food safety policies as a result of participating in relevant educational programs.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	5

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior

**Outcome #16**

**1. Outcome Measures**

(4.7b) Number of communities/ firms/or organizations documented to have implemented improved practices or food safety policies as a result of participating in relevant educational programs.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	1

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
724	Healthy Lifestyle

**Outcome #17**

**1. Outcome Measures**

Expanded Food and Nutrition Education Program

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

CCE programs address certainty of availability and access to food, sufficiency of food, social and cultural acceptability of food, and nutritional quality and safety of food. Work in this program area ties well with CCE work in agriculture, and youth, families and communities. One approach includes the Expanded Food and Nutrition Education Program (EFNEP), which provides programming to low-income parents of young children and youth in 22 counties across New York State and the five boroughs of New York City.

**What has been done**

Nutrition staff provide a series of 6 or more nutrition education sessions to participants in groups or individually to facilitate acquisition of the knowledge, skills, attitudes and changed-behaviors to

encourage incorporation of healthy eating habits and an active lifestyle. Topics include food resource management, food safety, nutrition practices, and physical activity. Paraprofessional staff indigenous to the community are trained to apply adult learning principles to deliver engaging sessions that include hands on activities. During 2016, 5,960 adult graduates and 5,057 youth received at least six nutrition education contacts. EFNEP staff collect pre/post behavior checklists on each program graduate. This information is used to measure knowledge, attitude, and behavior changes made as a result of participation in the program. In addition dietary recall data is collected on a representative sample of program participants to document dietary changes as a result of program participation.

**Results**

Evaluation data, collected via surveys administered pre and post-education, demonstrated behavior change. As a result of participation in EFNEP, adult graduates realized the following: 90% of adult participants showed improvement in one or more nutrition practice, 82% of participants showed improvement in one or more food resource management practice, 68% of participants showed improvement in one or more food safety practice, and 48% of participants showed improvement in frequency of being physically active. EFNEP youth provided self-reported data as follows: 82% improved their ability to choose healthy foods, 51% increased their frequency of being physical active, 46% improved their food safety practices, and 32% increased their food preparation skills.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
607	Consumer Economics
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population
724	Healthy Lifestyle

**V(H). Planned Program (External Factors)**

**External factors which affected outcomes**

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

**Brief Explanation**

Pockets of high unemployment in the state affect how public and private funds are allocated to address community needs. In some instances, family subsistence will be a higher priority than improved nutrition and physical activity behaviors, or improved access to healthy food and activity opportunities. As an example of the latter, in New York State, cost-cutting proposals include closing some public parks and reducing recreational physical activity programs. In addition, some decision-makers and others in the community may not agree with all aspects of an ecological approach to childhood obesity prevention. They may disagree with community or institutional policy changes such as eliminating non-nutritious snacks from after school activities and place all responsibility on the individual

and the family, disregarding policy, system, and environmental influences outside the family.

## V(I). Planned Program (Evaluation Studies)

### Evaluation Results

Each of the plans addresses a broad combination of applied research and extension initiatives spanning multiple audiences, methods, and intended outcomes. A combination of routine program monitoring and documentation, near-term outcome assessment, and targeted follow-up activities are expected to provide a comprehensive assessment. We work towards this goal by doing two things - professional development to enhance evaluation capacity of our system and collecting quantitative and qualitative documentation of local, regional and statewide programs.

**Evaluation Capacity Building:** Cornell Cooperative Extension has worked with the Cornell Office of Research on Evaluation (CORE) to strengthen evaluation practice and build evaluation capacity. CORE developed The Systems Evaluation Protocol that takes programs from logic models (columnar) to pathway models (a visual model that shows a relationship of short-term, mid-term and long-term outcomes) and helps to create an evaluation strategy. CORE tested and refined The Systems Evaluation Protocol in partnership with CCE programs from 2006 - 2015. The Protocol has been integrated into professional development in CCE, to promote consistent approaches to evaluation of county-based, regional, and statewide programs. Although the formal project connection with CORE ended in 2015, access to the Netway and online training continues to be available. Additionally, CCE program leaders are being trained in logic and pathway modeling through the CCE Program Development Leadership Cohort, an in-depth and comprehensive professional development experience targeting program leaders to become more proficient at program planning and evaluation.

**Regional/Statewide documentation examples.** Many regional and statewide programs are receiving federal capacity funds. Documentation of outcomes is a requirement of funding. Results shape future program efforts and impact program design. **An example evaluation from a funded project can be found below.**

**There is also a requirement for our local and regional programs to report on statewide outcomes/indicators:** Program documentation results are aggregated in a statewide accountability database that includes both qualitative and quantitative data for reporting and helping us to better understand impacts. Quantitative system-wide outcome data is reported in the outcome portion of this report.

### Key Items of Evaluation

Example evaluation for- Parent Stress, Child Feeding (Carol Devine)- pre-post evaluation survey conducted in person or by telephone

Parents face many challenges in managing child feeding. A pilot project was designed to evaluate the feasibility of a checklist approach to promote home offering of vegetables and fruits to children by busy parents. Low income mothers of young children were recruited by an Extension nutrition educator through child care and nutrition education settings, and the social media pages of the Cooperative Extension office in one county in Upstate New York.

The project aims were to increase offering of vegetables and fruits to young children at home and to increase busy mothers' awareness of their child's vegetable and fruit intake.

Participating mothers were asked to offer their child at least 1 vegetable and 1 fruit on weekdays at home (outside of child care), to check off daily offerings of vegetables and fruits to that child for 6 weeks, and to report checklist results weekly by photographing the checklist and emailing the photo to study personnel, in response to a text reminder.

The evaluation surveys covered vegetables and fruits offered and eaten by the index child on the previous day, socio-demographic characteristics and meal patterns. The follow up survey also asked mothers to evaluate the checklist activity. Both intervention (.68 more offered) and comparison (.27 more offered) mothers reported offering more vegetables to their children at follow up compared to baseline; intervention mothers reported a greater increase. As expected, numbers of vegetables offered were higher than amounts eaten. The mean difference in offer vs. eaten for vegetables at baseline was .59 vegetables in the intervention group and .88 vegetables in the comparison group. At follow up the mean difference in both groups was 1 serving. Both intervention (.81 more) and comparison (.25 more) mothers reported offering more fruits to their children at follow up compared to baseline. Numbers of fruits offered were higher than amounts eaten in the intervention group (mean = .41 fruits), with no difference in the comparison group. At follow up the mean difference in offer vs. eaten in the intervention group was .82 fruits and .25 in the comparison group. The mean number of vegetables and fruits offered to children daily reported on checklists over 6 weeks did not vary. As expected, the children did not eat all of the vegetables and fruits offered, but mothers reported that the amounts eaten also increased in the intervention group between baseline and follow up. Intervention mothers found the checklist simple to use and beneficial. Mothers reported that the checklist increased their awareness and reminded them to offer vegetables and fruits. Some observed that it led them to offer more vegetables to their child and to talk with others who help feed their child.

The small non-random sample and self-reported nature of this pilot limits the conclusions that can be drawn, but it is encouraging that intervention mothers who used the Checklist to track vegetable and fruit offerings to their children reported offering increased numbers of vegetables and fruits to their children at follow up over baseline, both on the surveys and in the evaluation comments.

More detail about this project can be found at:

- [http://www.human.cornell.edu/outreach/upload/CHE\\_DNS\\_Devine\\_Time.pdf](http://www.human.cornell.edu/outreach/upload/CHE_DNS_Devine_Time.pdf)
- <http://www.human.cornell.edu/bio.cfm?netid=cmd10>

**V(A). Planned Program (Summary)**

**Program # 5**

**1. Name of the Planned Program**

4-H Youth Development/Children, Youth and Families

Reporting on this Program

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
134	Outdoor Recreation	1%		9%	
511	New and Improved Non-Food Products and Processes	3%		0%	
607	Consumer Economics	7%		0%	
608	Community Resource Planning and Development	9%		0%	
610	Domestic Policy Analysis	4%		0%	
611	Foreign Policy and Programs	8%		0%	
801	Individual and Family Resource Management	8%		0%	
802	Human Development and Family Well-Being	13%		53%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	7%		0%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	4%		16%	
805	Community Institutions, Health, and Social Services	6%		0%	
806	Youth Development	30%		20%	
901	Program and Project Design, and Statistics	0%		2%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

**1. Actual amount of FTE/SYs expended this Program**

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	308.0	0.0	3.0	0.0
<b>Actual Paid</b>	323.6	0.0	3.0	0.0

<b>Actual Volunteer</b>	11786.0	0.0	0.0	0.0
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**2. Institution Name:** Cornell University

**Actual dollars expended in this Program (includes Carryover Funds from previous years)**

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
3223178	0	397415	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
3223178	0	805049	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**2. Institution Name:** NY State Agricultural Experiment Station

**Actual dollars expended in this Program (includes Carryover Funds from previous years)**

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

**Youth:** 4-H Youth Development is a comprehensive, statewide positive youth development program. 4-H entails a wide variety of applied research and educational methods based on need and local context. Campus-based faculty and Extension Associates, Program Work Teams (PWTs), State Office staff, the New York State Association of CCE 4-H Educators (NYSACCE4-HE), and county-based educators are all involved in designing, implementing, and evaluating program efforts.

A variety of educational strategies are used to support county educators and volunteers. Professional development goals include assisting colleagues in gaining the knowledge and skills necessary to assess the ranges of possibilities that exist within and among initiatives (i.e., Mission Mandates). Trained 4-H educators and staff, volunteers, youth, school teachers, community agency staff and others lead youth in 4-H projects.



4-H projects are a planned series of experiential learning opportunities in a variety of settings. Through their projects, youth develop knowledge, practical skills, and life skills (e.g., robotics, self-awareness, public presentation, responsible decision-making).

### **Delivery Modes**

**4-H** takes place in a variety of settings including after school programming, camps, 4-H clubs, school enrichment activities, camps, and community events.

**Family:** This is a comprehensive, statewide educational program entailing multiple education methods depending on local context and need. Campus-based faculty and Extension Associates and county-based educators are involved in designing, implementing, and evaluating tailored (as well as state-wide) educational efforts depending on the focus and scope of their role.

### **Sample Statewide Program Initiatives that fall within this Plan of Work:**

- 4-H and NYS Library Partnership
- 4-H National Mentoring Program
- ACT (Assets Coming Together) for Youth
- Children, Youth, and Families at Risk Program (CYFAR)
- Cornell Early Childhood Program
- Cornell Research Program on Self-Injurious Behavior
- Design & Environmental Analysis: knowledge, ideas, and designs that contribute to improving the places in which we work, live, learn, heal, and play
  - Events: 4-H Career Explorations Conference, Capital Days, State Teen Action Representative Retreat (STARR), National 4-H Conference, Dairy Discovery Days, Animal Crackers, Public Presentations, State Fair, etc.
- Family Economics and Resource Management
- Operation Military Kids
- Parenting in Context Initiative
- PROSPER
- Public Presentations
- Role of Grandparents in the Lives of Adolescent Grandchildren
- Volunteer development opportunities and events

## **2. Brief description of the target audience**

### **Youth**

- Young people ages 5-19: Cloverbuds (5-8), pre-teens (9-12), and teens (13-19)
- Youth development educators, staff, and volunteers
- Families, parents, and guardians
- Youth-serving organizations
- Teachers and schools (elementary, middle, high school)
- Community leaders
- Priority audiences include youth not formerly served and military youth and families

### **Family**

- Parents, grandparents and other caregivers
- Child care providers

- Community stakeholders such as employers, leaders and policy makers at local/state levels
- Low and moderate-income households who are especially vulnerable to financial setbacks and have less disposable income to commit to savings
- Low-income households living in poor-quality housing

### 3. How was eXtension used?

Cornell Cooperative Extension supports and promotes eXtension communities of practice, the eXtension public site and the professional development offered through eXtension.org. Staff across the state are encouraged to be involved in appropriate COPs, and the link to eXtension is promoted on the front page of the Cornell Cooperative Extension public staff site. Currently, 350 staff are registered, 156 are active users of eXtension, 28 of which are faculty members. Staff have cited the usefulness of COPs - particularly where there are identified national projects - such as with Financial Security for All COP.

Examples of involvement include:

- **Jeff Piestrak**, Outreach Specialist for Mann Library at Cornell, is working with faculty and staff at Cornell, several other LGUs and NIFA to implement recommendations following a research fellowship on **Land Grant Informatics** co-sponsored by eXtension. A focus is making data and information resources more discoverable, shareable and usable in support of Extension programming and impact. That includes a new cross-disciplinary Local & Regional Food Systems initiative at Cornell led by faculty member Anu Rangarajan modeled after and connected to similar efforts at other institutions like MSU and Virginia Tech. Some initial support is being offered by eXtension with additional funding sources being explored.
- **Heidi Mouillesseaux-Kunzman**, Senior Extension Associate with the Community and Regional Development Institute, Development Sociology, co-leads the **Enhancing Rural Community Capacity** Community of Practice. A key focus of the ERCC CoP over the last year is further developing Foundations of Practice, a national training program targeted to community developers. The CoP was selected to participate in eXtension's 2016 Community Issues Corps Designathon to help move this initiative forward.
- **Keith Tidball**, Senior Extension Associate in the Department of Natural Resources and Assistant Director of Cornell Cooperative Extension leads the **Community Capacity Building concentration area of the Military Families Learning Network**, and also serves as a delegate and New York State program lead of the **Extension Disaster Education Network**. Both eXtension networks evolved from eXtension communities of practice.

Examples of participation in COPs in this plan of work area include:

- Agriscience/Ag-STEM
- Citizen Science
- College Preparation
- Delinquency Prevention through Extension
- Delinquency Prevention through Life Skills Education
- Diversity Equity and Inclusion
- Families and Child Well-Being Learning Network
- Families, Food and Fitness
- Family Caregiving
- Financial Security for All
- For Youth, For Life
- Healthy Food Choices in Schools
- Just In Time Parenting
- Managing in Tough Times Community
- Military Families
- Teen Leadership
- Volunteerism

- Youth Agriculture
- Youth Geospatial Technology

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	156693	4902621	348404	10900888

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

Year: 2016  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
<b>Actual</b>	21	126	147

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- {No Data Entered}

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	(5.1a) Number of youth participants who learn life skills (e.g., self-motivation, goal-setting, conflict resolution, resilience, empathy, decision-making)
2	(5.1b) Number of youth participants who demonstrate ability to express their ideas confidently and competently.
3	(5.1c) Number of adult volunteers documented to mentor and advise youth and other adult volunteers in an effective and positive manner.
4	(5.1d) Number of youth participants documented as serving in age-appropriate leadership roles engaged in youth voice (i.e. youth engaged in youth-led opportunities, youth participants solving community issues, participants who work with elected officials on community issues)
5	(5.1e) Number of youth who increased number of youth organizations/ programs documented as incorporating youth voice in programming to reflect youth needs, interests, and excitement for learning (i.e. increased number of youth-adult partnerships, increased number of youth taking political action, increased number of mentors, and increased youth voice in communities being served.)
6	(5.2a) Number of participants demonstrating increased awareness of STEM, interest in STEM, improved STEM abilities, and/or increased awareness of opportunities to contribute to society using STEM skills.
7	(5.2b) Number of participants that report improved school achievement or have been observed to improve academic improvement and/or success in school science.
8	(5.2c) Number of youth applying STEM learning to contexts outside 4-H programs, e.g., school classes, science fairs, invention contests, etc.
9	(5.2d) Number of youth expressing interest/demonstrating aspirations towards STEM careers, e.g., career fairs, job shadowing, volunteer work or internships.
10	(5.2e) Number of youth adopting and using new scientific methods or improved technology.
11	(5.3a) Number of youth documented to have practiced life skills in authentic decision-making partnerships with adults.
12	(5.3b) Number of youth who demonstrate application of skills to civic life, within and beyond the 4-H context.
13	(5.3c) Number of youth who demonstrate improved or advanced workforce skills.
14	(5.3d) Number of youth documented instances in which youth and adults partner to improve quality of life within a community.
15	(5.4a) Number of parents and other adults providing parental care who adopt developmentally appropriate and effective parenting behaviors and methods.
16	(5.4b) Number of parents/ relative caregivers who report experiencing positive changes in parent-child relationships and parenting skills that they attribute to implementing new parenting behaviors and methods learned in parent education programs.

17	(5.5a) Number of participating infant and child caregivers reporting to have applied positive care-giving practices.
18	(5.5b) Number of participating persons with care-requiring dependents reporting to have used childcare quality characteristics in their care selection.
19	(5.5c) Number of participating persons with care-requiring dependents reporting positive change in childcare as a result of participating in educational programs.
20	(5.6a) Number of program participants reporting to have been involved in community level assessments of family care needs.
21	(5.6b) Number of communities documented to have taken action to address family needs that can be related to educational programs and/or critical community collaborations provided.
22	(5.7a) Number of program participants reporting they are practicing improved money management skills such as comparison shopping, paying bills on time, paying more than minimum payment, checking credit report, and reviewing and understanding bills/statements as a means to meeting financial goals.
23	(5.7b) Number of program participants reporting to have met day-to-day financial obligations while also progressing on future goals for home ownership, savings, retirement accounts, etc.
24	(5.7c) Number of program participants reporting to have reduced debts and/or increased savings.
25	(5.8a) Number of program participants documented to have taken measures to prevent or remediate indoor air quality issues.
26	Positive Youth Development, STEM, and Youth Civic Engagement
27	4-H Geospatial Sci And Tech

**Outcome #1**

**1. Outcome Measures**

(5.1a) Number of youth participants who learn life skills (e.g., self-motivation, goal-setting, conflict resolution, resilience, empathy, decision-making)

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

**Year                  Actual**

2016

58862

### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

**What has been done**

**Results**

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

## Outcome #2

### 1. Outcome Measures

(5.1b) Number of youth participants who demonstrate ability to express their ideas confidently and competently.

### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

### 3a. Outcome Type:

Change in Action Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2016	29856

### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

**What has been done**

**Results**

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

**Outcome #3**

**1. Outcome Measures**

(5.1c) Number of adult volunteers documented to mentor and advise youth and other adult volunteers in an effective and positive manner.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	5042

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
806	Youth Development

**Outcome #4**

**1. Outcome Measures**

(5.1d) Number of youth participants documented as serving in age-appropriate leadership roles engaged in youth voice (i.e. youth engaged in youth-led opportunities, youth participants solving community issues, participants who work with elected officials on community issues)

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	15641

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
805	Community Institutions, Health, and Social Services
806	Youth Development

**Outcome #5**

**1. Outcome Measures**

(5.1e) Number of youth who increased number of youth organizations/ programs documented as incorporating youth voice in programming to reflect youth needs, interests, and excitement for learning (i.e. increased number of youth-adult partnerships, increased number of youth taking political action, increased number of mentors, and increased youth voice in communities being served.)

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure



**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	6193

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
806	Youth Development

**Outcome #6**

**1. Outcome Measures**

(5.2a) Number of participants demonstrating increased awareness of STEM, interest in STEM, improved STEM abilities, and/or increased awareness of opportunities to contribute to society using STEM skills.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	84364

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

#### Outcome #7

##### 1. Outcome Measures

(5.2b) Number of participants that report improved school achievement or have been observed to improve academic improvement and/or success in school science.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2016	24819

##### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

#### Outcome #8

##### 1. Outcome Measures

(5.2c) Number of youth applying STEM learning to contexts outside 4-H programs, e.g., school classes, science fairs, invention contests, etc.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	31927

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
806	Youth Development

**Outcome #9**

**1. Outcome Measures**

(5.2d) Number of youth expressing interest/demonstrating aspirations towards STEM careers, e.g., career fairs, job shadowing, volunteer work or internships.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	18214

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
806	Youth Development

**Outcome #10**

**1. Outcome Measures**

(5.2e) Number of youth adopting and using new scientific methods or improved technology.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	16554

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being
805	Community Institutions, Health, and Social Services
806	Youth Development

**Outcome #11**

**1. Outcome Measures**

(5.3a) Number of youth documented to have practiced life skills in authentic decision-making partnerships with adults.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	10271

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being
805	Community Institutions, Health, and Social Services
806	Youth Development

**Outcome #12**

**1. Outcome Measures**

(5.3b) Number of youth who demonstrate application of skills to civic life, within and beyond the 4-H context.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	9757

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being
805	Community Institutions, Health, and Social Services
806	Youth Development

**Outcome #13**

**1. Outcome Measures**

(5.3c) Number of youth who demonstrate improved or advanced workforce skills.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
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**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services
806	Youth Development

**Outcome #14**

**1. Outcome Measures**

(5.3d) Number of youth documented instances in which youth and adults partner to improve quality of life within a community.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	8232

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services
806	Youth Development

#### Outcome #15

##### 1. Outcome Measures

(5.4a) Number of parents and other adults providing parental care who adopt developmentally appropriate and effective parenting behaviors and methods.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

<b>Year</b>	<b>Actual</b>
2016	7236

##### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being
806	Youth Development



**Outcome #16**

**1. Outcome Measures**

(5.4b) Number of parents/ relative caregivers who report experiencing positive changes in parent-child relationships and parenting skills that they attribute to implementing new parenting behaviors and methods learned in parent education programs.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	6578

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being
806	Youth Development

**Outcome #17**

**1. Outcome Measures**

(5.5a) Number of participating infant and child caregivers reporting to have applied positive caregiving practices.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	3513

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
607	Consumer Economics
801	Individual and Family Resource Management

**Outcome #18**

**1. Outcome Measures**

(5.5b) Number of participating persons with care-requiring dependents reporting to have used childcare quality characteristics in their care selection.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	1009

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
607	Consumer Economics
801	Individual and Family Resource Management

**Outcome #19**

**1. Outcome Measures**

(5.5c) Number of participating persons with care-requiring dependents reporting positive change in childcare as a result of participating in educational programs.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	910

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
607	Consumer Economics
801	Individual and Family Resource Management

**Outcome #20**

**1. Outcome Measures**

(5.6a) Number of program participants reporting to have been involved in community level assessments of family care needs.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	581

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
607	Consumer Economics
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

**Outcome #21**

**1. Outcome Measures**

(5.6b) Number of communities documented to have taken action to address family needs that can be related to educational programs and/or critical community collaborations provided.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	94

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
608	Community Resource Planning and Development
806	Youth Development

**Outcome #22**

**1. Outcome Measures**

(5.7a) Number of program participants reporting they are practicing improved money management skills such as comparison shopping, paying bills on time, paying more than minimum payment, checking credit report, and reviewing and understanding bills/statements as a means to meeting financial goals.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	6193

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
608	Community Resource Planning and Development
806	Youth Development

**Outcome #23**

**1. Outcome Measures**

(5.7b) Number of program participants reporting to have met day-to-day financial obligations while also progressing on future goals for home ownership, savings, retirement accounts, etc.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	519

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
806	Youth Development

#### Outcome #24

##### 1. Outcome Measures

(5.7c) Number of program participants reporting to have reduced debts and/or increased savings.

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2016	913

##### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

#### Outcome #25

##### 1. Outcome Measures

(5.8a) Number of program participants documented to have taken measures to prevent or remediate indoor air quality issues.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	871

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
806	Youth Development

**Outcome #26**

**1. Outcome Measures**

Positive Youth Development, STEM, and Youth Civic Engagement

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	0



### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Children spend half as much time outside as they did 20 years ago, and many are disconnected from nature. Nationally and in New York State (NYS), 4-H aims to engage youth in science, technology, engineering and math (STEM) through experiential and inquiry-based learning, but many volunteer leaders feel ill-equipped to lead these sorts of activities. This project coupled 4-H's extensive youth development programs with the Cornell Lab of Ornithology's experience in building stronger connections with nature through exploratory activities, investigations, and participation in citizen science. This project explored the integration of the Lab of Ornithology's user-friendly curriculum materials into CCE professional development for 4-H educators, club leaders, afterschool providers, and camp staff in order to engage children in citizen science and scientific inquiry activities that build closer connections with nature through meaningful engagement in STEM.

#### What has been done

This project included an ongoing series of workshops, webinars, and support to CCE staff in order to grow a community of practice around engaging youth in outdoor activities to grow STEM skills and interest. There was a focus on curriculum development and adaptation to grow educator confidence in curriculum use and use of the Lab of Ornithology citizen science programs and applications. To reach these goals the Cornell Lab of Ornithology orchestrated intensive 2-day on-site staff trainings in years one and two and regional trainings in year 3. Staff also presented at statewide and national conferences for staff and youth and connected resources to eXtension. Focus groups and round table discussions were held to evaluate curriculum and usability.

#### Results

Educators learned strategies to engage youth in meaningful STEM experiences through nature-based inquiry and citizen-science projects, while increasing staff confidence and ability to conduct activities with 4-H youth. Throughout the project, enthusiasm for teaching STEM outdoors through nature and birds, in particular with eBird citizen science was observed. Staff were enthusiastic about the ease of use and accessibility of the eBird database and the eBird app as well as use of curriculum. Focus groups and facilitated discussion helped to shape curriculum and resource support. As a result of the pilot work completed, an e-newsletter was developed to reach staff with timely announcements, and webinar/distance training was revised to be shorter and provide just-in-time support for busy staff. State and national partnerships and workshops occurring as a result of this project have contributed to growing a community of 4-H citizen-science champions and building 4-H STEM capacity across the country.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
134	Outdoor Recreation
802	Human Development and Family Well-Being
901	Program and Project Design, and Statistics

**Outcome #27**

**1. Outcome Measures**

4-H Geospatial Sci And Tech

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Youth and science, technology, engineering and math (STEM) literature reveals that: U.S. student performance in mathematics and science is at or below student levels in other countries in the developed world, STEM literacy is a key to our economic future, participation in high quality out-of-school programs is linked to a lower incidence of problem behaviors, and that experiential learning is linked to higher student performance in mathematics and science. GPS/GIS/Remote sensing topics are used to help make the instruction of STEM topics more relevant, interesting, and effective. Technologies like GPS devices that allow youth to build and experiment with physical objects are used to provide opportunities for youth to collect and interact with various forms of data. NYS 4-H Geospatial Science programs work to create a pipeline of experiences that begin by engaging youth and then helping youth lead experiences, and eventually represent NYS 4-H STEM programs.

**What has been done**

Staff from the Cornell Soil and Crop Sciences Department led efforts for the NYS 4-H Geospatial science programs including leading:

- 4-H educator trainings in the use and application of GPS, GIS, remote sensing, and the emerging technology of unmanned aerial vehicles for resource management data collection.
- Youth leader trainings in technology and leadership to prepare teens to present at local, state and national conferences.
- Successful application for the 2016 4-H National Youth Science Day Challenge: Drone Discovery: <http://4-h.org/parents/national-youth-science-day/4-h-nysd-2016-drone-discovery/> The remote sensing model activity uses foam gliders and mini keychain cameras designed as a part of the 4-H National Youth Science Day Challenge (NYSDC).

### Results

Capacity built within the 4-H Geospatial Science program was visible with: teens attending the 4-H Career Explorations Conference held at Cornell University who were later part of the pool of 4-H youth who provided leadership at the State Fair Geospatial Science and Technology exhibit. 2. A CALS/CCE Summer intern supported the drone programs at CCE Oneida and the Children of Immigrant Families program. 3. National 4-H sold over 9,000 Drone kits and (developed by Cornell team) with activities that reached 100,000 youth across the country. Youth indicated that activities provided an opportunity for a high level of engagement and knowledge sharing. 4. Youth involved in 4-H in NYS report many STEM-related impacts. Over 84,000 youth from across the NYS 4-H program demonstrated an increased awareness of STEM and Improved STEM skills, 38% of which indicated that they have applied STEM learning to contexts outside of 4-H, and 30% reported school academic improvement. Individual 4-H Geospatial Science programs are evaluated with narrative observations, suggestions, and reflections from participants. As the program evolves with rapid advances in technology, continual feedback from extension educators to the Cornell Soil and Crop Sciences Department informs adjustments in content and teaching techniques.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

### V(H). Planned Program (External Factors)

#### External factors which affected outcomes

- Economy
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

#### Brief Explanation

**Youth** Fiscal pressures internal to Extension and among community organizations influence the scope and quality of programming available to youth. The increasing diversity of our populations creates the need for an array of program materials, strategies, and a dedication to multicultural competencies. Changing educational standards influence the acceptability or credibility of existing curricula. Regional and community demographic differences influence both program strategies and professional development needs.

**Family** The economic, political and governmental sectors affect the quality, availability and accessibility of childcare. The growth of aging and minority populations in the US means more diverse cultures and values related to parenting, childcare, and family caregiving. Natural disasters and the economy affect household financial status and impact energy issues. They also affect the quality of the indoor air environment. Government regulation and policies driven by public priorities can change the circumstances of personal finances, the energy market and the quality of the indoor household environment. Public and private funders and CCE may have fewer fiscal resources and other resources to devote to the quality of life in financial, energy and indoor air quality matters.

## **V(I). Planned Program (Evaluation Studies)**

### **Evaluation Results**

Each of the plans addresses a broad combination of applied research and extension initiatives spanning multiple audiences, methods, and intended outcomes. A combination of routine program monitoring and documentation, near-term outcome assessment, and targeted follow-up activities are expected to provide a comprehensive assessment. We work towards this goal by doing two things - professional development to enhance evaluation capacity of our system and collecting quantitative and qualitative documentation of local, regional and statewide programs.

**Evaluation Capacity Building:** Cornell Cooperative Extension has worked with the Cornell Office of Research on Evaluation (CORE) to strengthen evaluation practice and build evaluation capacity. CORE developed The Systems Evaluation Protocol that takes programs from logic models (columnar) to pathway models (a visual model that shows the relationship of short-term, mid-term and long-term outcomes) and helps to create an evaluation strategy. CORE tested and refined The Systems Evaluation Protocol in partnership with CCE programs from 2006 - 2015. The Protocol has been integrated into professional development in CCE, to promote consistent approaches to evaluation of county-based, regional, and statewide programs. Although the formal project connection with CORE ended in 2015, access to the Netway and online training continues to be available. Additionally, CCE program leaders are being trained in logic and pathway modeling through the CCE Program Development Leadership Cohort, an in-depth and comprehensive professional development experience targeting program leaders to become more proficient at program planning and evaluation.

**Regional/Statewide documentation examples.** Many regional and statewide programs are receiving federal capacity funds. Documentation of outcomes is a requirement of funding. Results shape future program efforts and impact program design. **An example evaluation from a funded project can be found below.**

**There is also a requirement for our local and regional programs to report on statewide outcomes/indicators:** Program documentation results are aggregated in a statewide accountability database that includes both qualitative and quantitative data for reporting and helping us to better understand impacts. Quantitative system-wide outcome data is reported in the outcome portion of this report.

### **Key Items of Evaluation**

Example evaluation for the- Building a Community Legacy Together (BCLT) - Intergenerational Program (Karl Pillemer) - use of pre-post questionnaire

The overarching research questions that guided this research project include:

- By providing both didactic and experiential learning about aging, does the BCLT program lead to increased knowledge about older people and aging in our society?
- Does participation in BCLT affect attitudes and stereotypes toward older people?
- Does participation in BCLT affect relevant outcomes among youth, such as sense of purpose, self-esteem, and attitudes toward community service?
- Does BCLT affect relevant outcomes among elders such as loneliness, self-esteem, generativity, and psychological well-being?

- Do program organizers find BCLT easy to implement, including recruiting participants and carrying out program activities?

Pre-test and post-test questionnaires were used with all youth and elders years 1-3. Pre-tests were administered within a month of the program start, and post-tests were collected approximately one month after the program end. An extensive process evaluation was conducted, using telephone interviews with youth, elders, and program leaders after the BCLT program was completed. Program leaders also submitted weekly progress reports while they were actively facilitating the BCLT program.

In Year 1, the goal was primarily "proof of concept" for the BCLT program. In Years 2 and 3, a quasi-experimental design, using comparison counties that were similar to treatment counties to collect data on 4-H youth comparable to BCLT participants. 187 youth and 182 elders were recruited to take part in the program over the course of the project. Youth were recruited from 4-H, "Relatives as Parents Program" (RAPP), a high school service class and an after school program. Elders were recruited from RAPP, personal contacts, a senior center and a nursing home.

The treatment youth's attitudes toward older people positively changed as a result of the program, demonstrated by a significant difference between treatment and control groups over time ( $t(54) = 5.8733, p < .01$ ). The youth's attitudes toward a career in service showed a slight increase, though not statistically significant. However, the youth's attitudes toward working with older people increased from pre-test ( $M = 3.10, SD = 0.60$ ) to post-test ( $M = 3.28, SD = 0.46$ ), closely bordering on statistical significance,  $t(35) = 2.0238, p = .051$ . Most notably, there was a significant difference in the youth's sense of purpose, ( $t(52) = 2.8564, p < .01$ ).

With regard to elders, positive effects were found on most variables, including sense of purpose and perceived social integration. It was hypothesized that the lack of effects are due to the limited engagement of the elders in comparison to the youth; the elder's role was only as participants in a single interview. The program is being adapted to include more extensive participation of the elders.

More detail about this project can be found at:

- <http://citra-bclt.human.cornell.edu/>
- <http://www.human.cornell.edu/bio.cfm?netid=kap6>

**V(A). Planned Program (Summary)**

**Program # 6**

**1. Name of the Planned Program**

Community and Economic Vitality

Reporting on this Program

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
131	Alternative Uses of Land	25%		16%	
134	Outdoor Recreation	5%		0%	
602	Business Management, Finance, and Taxation	5%		0%	
608	Community Resource Planning and Development	34%		62%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	21%		22%	
805	Community Institutions, Health, and Social Services	10%		0%	
<b>Total</b>		100%		100%	

**V(C). Planned Program (Inputs)**

1. Actual amount of FTE/SYs expended this Program

Year: 2016	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	121.0	0.0	3.0	0.0
<b>Actual Paid</b>	104.9	0.0	1.0	0.0
<b>Actual Volunteer</b>	6510.0	0.0	0.0	0.0

2. Institution Name: Cornell University

Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1044316	0	177819	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1044316	0	300344	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**2. Institution Name:** NY State Agricultural Experiment Station

**Actual dollars expended in this Program (includes Carryover Funds from previous years)**

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

CCE, CUAES and NYSAES have a commitment to the people of New York to build self-capacity among citizens, leaders, and local officials so they are better positioned to address challenges and opportunities, improve quality of life, and build strong and vibrant communities. Through integrated research and extension agendas, we can help develop effective and collaborative agriculture, energy, emergency management, and land use/natural resource management approaches and policies that enhance economic, environmental and social connections. Educators work with a variety of state and local groups to tackle projects that vary in nature from applied research to pilot projects or case studies. These activities, which are demand driven (locally or regionally initiated usually with sponsored or self-financing), provide valuable insights, resources and materials for extension education.

**Sample Statewide/Regional Initiatives that fall within this Plan of Work**

·Agriculture and Food Systems Development: Community and Economy

- Community and Energy
- Community Capacity Building
- Entrepreneurship

- Land Use Education
- Leadership Development
- Master Gardener Volunteer Program
- New York Extension Disaster Education Network (NY EDEN)
- Regional Economic Development
- Sustainable and Resilient Communities
- Training for Local Officials
- Workforce Development

## 2. Brief description of the target audience

- Elected officials, community leaders, business and economic leaders, not-for-profit agencies, schools, environmental groups, agribusiness leaders, etc.
- Retirees and other elders who have time to engage in community stewardship
- Engaged community citizens
- Communities as a whole: youth and adults organizations, businesses, schools, and other institutions
- Agriculture/horticulture/natural resource enterprise managers, community residents and visitors, youth, local media, local officials, and local planning and economic development staff
- Workforce development specialists

## 3. How was eXtension used?

Cornell Cooperative Extension supports and promotes eXtension communities of practice, the eXtension public site and the professional development offered through eXtension.org. Staff across the state are encouraged to be involved in appropriate COPs, and the link to eXtension is promoted on the front page of the Cornell Cooperative Extension public staff site. Currently 350 staff are registered, 156 are active users of eXtension, 28 of which are faculty members. Staff have cited the usefulness of COPs - particularly where there are identified national projects - such as with Financial Security for All COP.

Examples of involvement include:

- **Jeff Piestrak**, Outreach Specialist for Mann Library at Cornell, is working with faculty and staff at Cornell, several other LGUs and NIFA to implement recommendations following a research fellowship on **Land Grant Informatics** co-sponsored by eXtension. A focus is making data and information resources more discoverable, shareable and usable in support of Extension programming and impact. That includes a new cross-disciplinary Local & Regional Food Systems initiative at Cornell led by faculty member Anu Rangarajan modeled after and connected to similar efforts at other institutions like MSU and Virginia Tech. Some initial support is being offered by eXtension with additional funding sources being explored.
- **Heidi Mouillesseaux-Kunzman**, Senior Extension Associate with the Community and Regional Development Institute, Development Sociology, co-leads the **Enhancing Rural Community Capacity** Community of Practice. A key focus of the ERCC CoP over the last year is further developing Foundations of Practice, a national training program targeted to community developers. The CoP was selected to participate in eXtension's 2016 Community Issues Corps Designathon to help move this initiative forward.
- **Keith Tidball**, Senior Extension Associate in the Department of Natural Resources and Assistant Director of Cornell Cooperative Extension leads the **Community Capacity Building concentration area of the Military Families Learning Network**, and also serves as a delegate and New York State program lead of the **Extension Disaster Education Network**. Both eXtension networks evolved from eXtension communities of practice.

Examples of participation in COPs in this plan of work area include:

- Citizen Science



- Community, Local and Regional Food Systems
- Creating Healthy Communities
- Diversity Equity and Inclusion
- Enhancing Rural Capacity
- Entrepreneurs and Their Communities
- Extension Disaster Education Network
- Extension Master Gardener
- Extension Master Gardener Coordinators
- Extension Master Gardener National Program Committee

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

2016	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	170266	4128073	6510	1652626

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

Year: 2016  
 Actual: 0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

2016	Extension	Research	Total
<b>Actual</b>	22	163	185

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- {No Data Entered}

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	(6.1a) Number of communities who plan for and implement initiatives on community based agricultural economic development, land use, energy, workforce development, business and entrepreneurial development and assistance, non-profit sector development and/or other elements of sustainable growth.
2	(6.1b) Number of residents and/or community leaders, who plan for and initiate steps to enhance facilities, and/or other community resources or services
3	(6.1c) Number of municipalities that were part of an intentional process re: intergovernmental cooperation
4	(6.1d) Number of communities establishing an infrastructure and climate to support entrepreneurs, local farms and agribusinesses attributable at least in part to initiatives of the program.
5	(6.1e) Number of communities documenting improvements in facilities and/or other community resources or services.
6	(6.2a) Number of communities instituting new or enhanced participatory processes related to community and economic vitality.
7	(6.2b) Number of local officials who cite LGU research and data as having influenced a decision
8	(6.2c) Number of documented instances in which a community effectively resolves a need or strengthens community assets attributable at least in part to participation in the program.
9	(6.3a) Number of communities and municipalities that address the connection between their land base and possible energy scenarios
10	(6.3b) Number of sustainability initiatives adopted
11	(6.3c) Number of communities that address climate change and energy issues in an integrated manner
12	(6.3d) Number of communities that incorporate energy use and development in their comprehensive plans
13	(6.4a) Number of communities utilizing information of NY-EDEN
14	(6.4b) Number of community leaders documented to apply community economic development and quality of life indicators to support decision-making.
15	(6.4c) Number of communities who were better prepared to deal with emergencies and disasters
16	(6.4d) Number of communities implementing projects that enhance community sustainability and/or protect public health and community well-being through sound environmental management
17	(6.5a) Number of municipalities adopting land use planning tools that incorporate environmental dimensions and/or develop new institutional arrangements to support land use

	planning and environmental management.
18	(6.5b) Number of communities adopting or updating farmland preservation and/or agricultural economic development plans
19	(6.6a) Number of residents and/or community leaders, who plan for and initiate steps to enhance public spaces
20	(6.6b) Number of new or enhanced community organizations or networks linking diverse sub-groups and focused on enhancing community sustainability.
21	(6.6c) Number of communities documenting improvements in public spaces.
22	(6.7a) Number of instances in which producers/ horticulture businesses/ natural resource enterprises, residents and community leaders work together to address issues
23	(6.7b) Number of agriculture/horticulture/natural resource business persons who are better prepared to deal with disasters and emergencies
24	(6.7c) Number of communities that assess how current policies and infrastructures sustain or impede agriculture/ horticulture/natural resource enterprises (such as farmland protection or including such enterprises in economic development planning) and how the enterprises are affected by public policy.
25	(6.7d) Number of communities that initiate specific plans to address agriculture/ horticulture/ natural resource enterprise related issues or capitalize on new opportunities including community agriculture initiatives.
26	(6.7e) Number of documented instances in which agriculture/community conflicts are resolved locally.
27	(6.7f) Number of communities documented to adopt, maintain, or expand policies supportive of appropriate agriculture/horticulture/ natural resource enterprise development and/or community agriculture.
28	(6.8a) Number of community residents practicing management tactics in residential landscapes and homes that work to sustain or enhance a healthy community and environment.
29	(6.8b) Number of community residents with improved availability and access to fresh fruits and vegetables.
30	(6.8c) Number of community education/demonstration food gardens established or maintained.
31	(6.1f) Number of new shared services among municipalities
32	Collective Indicators of Community: Community Supported Agriculture and Social Media

**Outcome #1**

**1. Outcome Measures**

(6.1a) Number of communities who plan for and implement initiatives on community based agricultural economic development, land use, energy, workforce development, business and entrepreneurial development and assistance, non-profit sector development and/or other elements of sustainable growth.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	150

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
602	Business Management, Finance, and Taxation
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

**Outcome #2**

**1. Outcome Measures**

(6.1b) Number of residents and/or community leaders, who plan for and initiate steps to enhance facilities, and/or other community resources or services

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	1257

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
608	Community Resource Planning and Development
805	Community Institutions, Health, and Social Services

**Outcome #3**

**1. Outcome Measures**

(6.1c) Number of municipalities that were part of an intentional process re: intergovernmental cooperation

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	97

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
602	Business Management, Finance, and Taxation
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

**Outcome #4**

**1. Outcome Measures**

(6.1d) Number of communities establishing an infrastructure and climate to support entrepreneurs, local farms and agribusinesses attributable at least in part to initiatives of the program.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	82

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
608	Community Resource Planning and Development
805	Community Institutions, Health, and Social Services

**Outcome #5**

**1. Outcome Measures**

(6.1e) Number of communities documenting improvements in facilities and/or other community resources or services.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	70

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
805	Community Institutions, Health, and Social Services

#### Outcome #6

##### 1. Outcome Measures

(6.2a) Number of communities instituting new or enhanced participatory processes related to community and economic vitality.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

Change in Condition Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2016	62

##### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
805	Community Institutions, Health, and Social Services



**Outcome #7**

**1. Outcome Measures**

(6.2b) Number of local officials who cite LGU research and data as having influenced a decision

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	38

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
131	Alternative Uses of Land
608	Community Resource Planning and Development

**Outcome #8**

**1. Outcome Measures**

(6.2c) Number of documented instances in which a community effectively resolves a need or strengthens community assets attributable at least in part to participation in the program.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	118

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
131	Alternative Uses of Land
134	Outdoor Recreation
608	Community Resource Planning and Development
805	Community Institutions, Health, and Social Services

**Outcome #9**

**1. Outcome Measures**

(6.3a) Number of communities and municipalities that address the connection between their land base and possible energy scenarios

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	37

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
608	Community Resource Planning and Development
805	Community Institutions, Health, and Social Services

**Outcome #10**

**1. Outcome Measures**

(6.3b) Number of sustainability initiatives adopted

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	28

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

#### Outcome #11

##### 1. Outcome Measures

(6.3c) Number of communities that address climate change and energy issues in an integrated manner

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

<b>Year</b>	<b>Actual</b>
2016	12

##### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

## **Outcome #12**

### **1. Outcome Measures**

(6.3d) Number of communities that incorporate energy use and development in their comprehensive plans

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Action Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	13

### **3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
131	Alternative Uses of Land
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

## **Outcome #13**

### **1. Outcome Measures**

(6.4a) Number of communities utilizing information of NY-EDEN

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	10

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
131	Alternative Uses of Land
608	Community Resource Planning and Development

**Outcome #14**

**1. Outcome Measures**

(6.4b) Number of community leaders documented to apply community economic development and quality of life indicators to support decision-making.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	33

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
131	Alternative Uses of Land
134	Outdoor Recreation
608	Community Resource Planning and Development

**Outcome #15**

**1. Outcome Measures**

(6.4c) Number of communities who were better prepared to deal with emergencies and disasters

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	14

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
131	Alternative Uses of Land

134	Outdoor Recreation
608	Community Resource Planning and Development
805	Community Institutions, Health, and Social Services

**Outcome #16**

**1. Outcome Measures**

(6.4d) Number of communities implementing projects that enhance community sustainability and/or protect public health and community well-being through sound environmental management

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	45

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
131	Alternative Uses of Land
134	Outdoor Recreation
608	Community Resource Planning and Development
805	Community Institutions, Health, and Social Services



**Outcome #17**

**1. Outcome Measures**

(6.5a) Number of municipalities adopting land use planning tools that incorporate environmental dimensions and/or develop new institutional arrangements to support land use planning and environmental management.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	19

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
131	Alternative Uses of Land
602	Business Management, Finance, and Taxation
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

### **Outcome #18**

#### **1. Outcome Measures**

(6.5b) Number of communities adopting or updating farmland preservation and/or agricultural economic development plans

#### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

#### **3a. Outcome Type:**

Change in Action Outcome Measure

#### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	30

#### **3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

### **Outcome #19**

#### **1. Outcome Measures**

(6.6a) Number of residents and/or community leaders, who plan for and initiate steps to enhance public spaces

#### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	78

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

**Outcome #20**

**1. Outcome Measures**

(6.6b) Number of new or enhanced community organizations or networks linking diverse sub-groups and focused on enhancing community sustainability.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
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**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
602	Business Management, Finance, and Taxation
608	Community Resource Planning and Development
805	Community Institutions, Health, and Social Services

**Outcome #21**

**1. Outcome Measures**

(6.6c) Number of communities documenting improvements in public spaces.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	12

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
602	Business Management, Finance, and Taxation
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

**Outcome #22**

**1. Outcome Measures**

(6.7a) Number of instances in which producers/ horticulture businesses/ natural resource enterprises, residents and community leaders work together to address issues

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	480

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
131	Alternative Uses of Land
134	Outdoor Recreation
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

**Outcome #23**

**1. Outcome Measures**

(6.7b) Number of agriculture/horticulture/natural resource business persons who are better prepared to deal with disasters and emergencies

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	1585

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
134	Outdoor Recreation
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

**Outcome #24**

**1. Outcome Measures**

(6.7c) Number of communities that assess how current policies and infrastructures sustain or impede agriculture/ horticulture/natural resource enterprises (such as farmland protection or including such enterprises in economic development planning) and how the enterprises are affected by public policy.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	921

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
131	Alternative Uses of Land
134	Outdoor Recreation
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

**Outcome #25**

**1. Outcome Measures**

(6.7d) Number of communities that initiate specific plans to address agriculture/ horticulture/ natural resource enterprise related issues or capitalize on new opportunities including community agriculture initiatives.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	102

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
131	Alternative Uses of Land
608	Community Resource Planning and Development

**Outcome #26**

**1. Outcome Measures**

(6.7e) Number of documented instances in which agriculture/community conflicts are resolved locally.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	286

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**



#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

#### Outcome #27

##### 1. Outcome Measures

(6.7f) Number of communities documented to adopt, maintain, or expand policies supportive of appropriate agriculture/horticulture/ natural resource enterprise development and/or community agriculture.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

<b>Year</b>	<b>Actual</b>
2016	96

##### 3c. Qualitative Outcome or Impact Statement

**Issue (Who cares and Why)**

**What has been done**

**Results**

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

**Outcome #28**

**1. Outcome Measures**

(6.8a) Number of community residents practicing management tactics in residential landscapes and homes that work to sustain or enhance a healthy community and environment.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	21419

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
131	Alternative Uses of Land
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

**Outcome #29**

**1. Outcome Measures**

(6.8b) Number of community residents with improved availability and access to fresh fruits and vegetables.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	16729

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities

**Outcome #30**

**1. Outcome Measures**

(6.8c) Number of community education/demonstration food gardens established or maintained.

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
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**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities

**Outcome #31**

**1. Outcome Measures**

(6.1f) Number of new shared services among municipalities

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2016	27

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
131	Alternative Uses of Land

**Outcome #32**

**1. Outcome Measures**

Collective Indicators of Community: Community Supported Agriculture and Social Media

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Actual
2016	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Community Supported Agriculture (CSA) is growing as a strategy to produce safe food in an environmentally sustainable and economically vitalizing manner. Individual CSAs have highly variable rates of success, however. One explanation is limited information on the size and receptivity of local markets. Most CSAs require payment in advance of the growing season for varieties its members do not choose. The novelty of this method can lead to confusion or dissatisfaction for new members. Tools for measuring the local "appetite" for these arrangements can help farms evaluate the extent to which there is interest in supporting local agriculture.

**What has been done**

Under his Hatch project (NYC-131406), Drew Margolin and his team of graduate and undergraduate researchers began development of a novel approach to estimate community receptivity for CSAs by examining the extent to which the public dialogue about food indicates strong, communal commitment to CSA principles of fresh, safe, and local food at a fair price. They used data from Yelp.com to infer community properties from the way in which people write about restaurants. Their analyses included comparisons of local versus ?out-of-town? reviewers, socioeconomic factors, and CSA density.

**Results**

Inspection of Yelp.com restaurant reviews revealed differences between local and visiting reviewers; locals tended to write more dynamic, story-like reviews. Researchers also found that the socioeconomic status of the community is important in defining expectations of reviewers. Inferring these expectations is key to inferring the normative identity of the community, understanding reviewers' perspectives when they describe their experiences, and uncovering the local perception of a given restaurant in its community. For example, when reviewers expect food

to be locally sourced, they are disappointed when it is not. If there is no expectation, they may be pleasantly surprised at the discovery; these expectations influence the reviewer's experience and how they describe it in their reviews. The team produced a visualization town-level review metrics: [http://margolin.cac.cornell.edu/Yelp\\_Projection\\_Porter/Yelp\\_Projection.html](http://margolin.cac.cornell.edu/Yelp_Projection_Porter/Yelp_Projection.html).

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities

#### V(H). Planned Program (External Factors)

##### External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Populations changes (immigration, new cultural groupings, etc.)

##### Brief Explanation

Communities operate in a complex and volatile context involving susceptibility to weather extremes, changing governmental policies and regulations, land uses demands and shifting development patterns, evolving consumer demands and globalization related economic factors. Weather-related disasters can greatly impact communities in terms of infrastructure damage and direct costs. The global, statewide, and regional economies directly impact local economies. Fundamental change is occurring in the state and regional economies. The specific implications of these external factors vary greatly by locale and across regions.

#### V(I). Planned Program (Evaluation Studies)

##### Evaluation Results

Each of the plans addresses a broad combination of applied research and extension initiatives spanning multiple audiences, methods, and intended outcomes. A combination of routine program monitoring and documentation, near-term outcome assessment, and targeted follow-up activities are expected to provide a comprehensive assessment. We work towards this goal by doing two things - professional development to enhance evaluation capacity of our system and collecting quantitative and qualitative documentation of local, regional and statewide programs.

**Evaluation Capacity Building:** Cornell Cooperative Extension has worked with the Cornell Office of Research on Evaluation (CORE) to strengthen evaluation practice and build evaluation capacity. CORE developed The Systems Evaluation Protocol that takes programs from logic models (columnar) to pathway models (a visual model that shows the relationship of short-term, mid-term and long-term outcomes) and helps to create an

evaluation strategy. CORE tested and refined The Systems Evaluation Protocol in partnership with CCE programs from 2006 - 2015. The Protocol has been integrated into professional development in CCE, to promote consistent approaches to evaluation of county-based, regional, and statewide programs. Although the formal project connection with CORE ended in 2015, access to the Netway and online training continues to be available. Additionally, CCE program leaders are being trained in logic and pathway modeling through the CCE Program Development Leadership Cohort, an in-depth and comprehensive professional development experience targeting program leaders to become more proficient at program planning and evaluation.

**Regional/Statewide documentation examples.** Many regional and statewide programs are receiving federal capacity funds. Documentation of outcomes is a requirement of funding. Results shape future program efforts and impact program design. **An example evaluation from a funded project can be found below.**

**There is also a requirement for our local and regional programs to report on statewide outcomes/indicators:** Program documentation results are aggregated in a statewide accountability database that includes both qualitative and quantitative data for reporting and helping us to better understand impacts. Quantitative system-wide outcome data is reported in the outcome portion of this report.

## Key Items of Evaluation

Example evaluation for the - HEART Club Encouraging Healthy Eating and Activity in Rural Towns (Rebecca Seguin)- use of focus groups, interviews, online surveys:

The HEART Club curriculum, guided by community-based participatory research methods, was designed to provide a step-wise process to guide and empower rural residents to improve healthy eating and physical activity opportunities in their community. HEART Clubs were led by Cornell Cooperative Extension Educators in Herkimer County, Schuyler County, and Wyoming County (PA) have been active for almost three years. Over the past year, additional HEART Clubs have been assembled across Montana and New York.

At each site, educators recruited 7-12 community members to collectively address an issue related to their local food or physical activity environment and establish benchmarks for self-monitoring of progress. At six months, all HEART Clubs documented successful progress and had accomplished three or more benchmarks. Participants showed improved knowledge and awareness of community needs and resources.

For the original three HEART Clubs, leaders and members were asked to complete an online survey. Survey concepts included attitudes, knowledge, awareness, and self-efficacy related to environmental and policy-related barriers and facilitators to physical activity and diet as well as implementing change in their communities. The project team also conducted in-depth key informant interviews with HEART Club leaders and focus groups with HEART Club members. The primary goal of collecting this information is for program improvement and evaluation.

To assess HEART Club progress in the eight new communities, focus groups and interviews were conducted with participants and leaders post-intervention. Leaders also completed an online evaluation survey. The majority of HEART Club groups in the eight towns documented satisfactory progress and had accomplished two or more benchmarks post-

intervention.

Extending the current project, the HEART Club curriculum was integrated into a rural heart disease prevention program, Strong Hearts, Healthy Communities. Extension agents and local health educators implemented HEART Clubs in eight additional towns, six in Montana and two in Upstate New York. Among the most successful groups, facilitators of progress included support from local stakeholders, effective leadership, and high group morale. Resource constraints, uncertain expectations, and unfeasible timelines were cited as barriers to HEART Club implementation. Participants felt overwhelmed by the prospect of community change while simultaneously trying to make personal health improvements and their initial resistance likely stalled progress. These findings highlight both the potential and challenges associated with rural civic engagement initiatives within the context of a lifestyle intervention program and can help guide improvements to ensure future success of this approach.

More detail about this project can be found at:

- <http://www.human.cornell.edu/bio.cfm?netid=rs946>
- <http://rebeccaseguin.weebly.com/heart-club.html>



## VI. National Outcomes and Indicators

### 1. NIFA Selected Outcomes and Indicators

<b>Childhood Obesity (Outcome 1, Indicator 1.c)</b>	
48257	Number of children and youth who reported eating more of healthy foods.
<b>Climate Change (Outcome 1, Indicator 4)</b>	
0	Number of new crop varieties, animal breeds, and genotypes with climate adaptive traits.
<b>Global Food Security and Hunger (Outcome 1, Indicator 4.a)</b>	
6650	Number of participants adopting best practices and technologies resulting in increased yield, reduced inputs, increased efficiency, increased economic return, and/or conservation of resources.
<b>Global Food Security and Hunger (Outcome 2, Indicator 1)</b>	
0	Number of new or improved innovations developed for food enterprises.
<b>Food Safety (Outcome 1, Indicator 1)</b>	
0	Number of viable technologies developed or modified for the detection and
<b>Sustainable Energy (Outcome 3, Indicator 2)</b>	
18	Number of farmers who adopted a dedicated bioenergy crop
<b>Sustainable Energy (Outcome 3, Indicator 4)</b>	
0	Tons of feedstocks delivered.