

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Climate Change

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
103	Management of Saline and Sodic Soils and Salinity	15%		2%	
111	Conservation and Efficient Use of Water	15%		6%	
132	Weather and Climate	13%		6%	
133	Pollution Prevention and Mitigation	15%		33%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	15%		25%	
306	Environmental Stress in Animals	15%		6%	
605	Natural Resource and Environmental Economics	12%		22%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Actual	2.7	0.0	14.9	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
72670	0	645679	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
163019	0	1963292	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
100714	0	1036802	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The Pennsylvania Climate Impact Assessment conducted by AES, in partnership with the Pennsylvania Department of Environmental Protection, inventoried the potential impacts of global climate change on Pennsylvania's climate, human health, the economy, and management of economic risks, forests, wildlife, fisheries, recreation, energy, agriculture, and tourism. In response, Extension has focused on heightening the integration of climate change and greenhouse gas management and mitigation across multiple programmatic offerings, particularly in the natural resource, energy, and agricultural production programs. The emphasis for Extension-led climate change research and education has centered on the trade-offs and outcomes of various management approaches for waste, energy, land, soil, and forest. CES integration of climate change research and outreach into programs will prepare Pennsylvanians and those responsible for localized generation of energy, stewardship of water, lands, forests, energy consumers, and agricultural producers to better consider the impacts of their practices on the emissions of greenhouse gases and the broader issue of climatic change. The "Managing Community and Urban Natural Resources" program weighs in prominently in this section. Trees and other natural resources provide communities with a wealth of environmental, social, and economic values and these ecosystem services have historically been undervalued and not well understood. In addition to providing critical "green infrastructure," community and urban forests also create healthy, livable, and sustainable communities. Mounting research conducted by various universities (Penn State, University of Washington, University of Massachusetts) and organizations (USDA Forest Service, International Society of Arboriculture, American Planning Association, Society of American Foresters) continues to illustrate the important role that trees, forests, and natural resources in regulating ecosystem services that support healthy people and places, especially carbon sequestration as an offset/sink for potential greenhouse gases).

2. Brief description of the target audience

The audiences served include municipalities, planning agencies, citizens groups and associations, farm and forest managers, conservation practitioners, agriculture and forest industry, regional, state, and federal agencies, local municipalities, and energy consumers.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA}	{NO DATA}	{NO DATA}	{NO DATA}
Actual	34984	329006	96	0

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

Patent Applications Submitted

Year: 2010
 Plan:
 Actual: 3

Patents listed

Serial No.: 61/298,424; Filed: 1/26/10; Title: Root Cortical Aerenchyma as a Selection Trait for Drought Tolerance in Plants

Serial No.: 61/342,429; Filed 4/14/10; Title: Strategies for the Transgenic Manipulation of Filamentous Fungi

Serial No.: 61/353,513; Filed: 6/10/10; Title: Root Cortical Aerenchyma as a Selection Trait for Abiotic Stress Tolerance in Plants

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	0	207

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of invention disclosures

Year	Target	Actual
2010	{No Data Entered}	1

Output #2

Output Measure

- Number of people enrolled and/or registered in programs

Year	Target	Actual
2010	{No Data Entered}	46103

Output #3

Output Measure

- Number of research projects completed

Year	Target	Actual
2010	{No Data Entered}	14

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of participants who were evaluated and demonstrated increased knowledge and skills
2	Number of participants who were evaluated in a follow up and who implement/adopt practices
3	Number of volunteers that helped with program leadership or program delivery

Outcome #1

1. Outcome Measures

Number of participants who were evaluated and demonstrated increased knowledge and skills

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Number of participants who were evaluated in a follow up and who implement/adopt practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Climate change forecasts accompanied by debate about the timeline, impacts, as well as rulemaking on the inclusion of carbon emissions under the Clean Air Act can obscure the specific actions that Pennsylvanians can take to diminish emissions of greenhouse gases from their day-to-day activities and the operations that they manage. Tree plantings, manure-to-energy (digesters), cover crop for growing biomass, no-till, and even household energy conservation along with a number of other strategies in forest, farm, community, and household level that can offset and/or mitigate emissions of carbon and other greenhouse gases. At the heart of climate change education is a growing interest across different groups for specific information that individuals can employ to reduce greenhouse gas emissions and potentially be better positioned for future participation in carbon trading markets.

What has been done

In partnership with the USDA Forest Service, Pennsylvania DCNR Bureau of Forestry, Pennsylvania Horticultural Society, county planning offices, municipal staff, and others, the program uses a number of delivery methods. 1) Face-to-face technical assist (consulting) for municipal staff, elected officials, nonprofits, and agency staff. This includes site visits as well as

consultation over the phone and internet (e.g., Altoona Planning Department). 2) Workshops in different regions of the state as well as at University Park (e.g., Annual Community Forest Conference and Tree Tenders Workshops). 3) Talks at workshops and events hosted by others (e.g., presentation to Pittsburgh City Council, talk for PennDot Roadside Managers Meeting). 4) Webinars hosted by School of Forest Resources or others including PA Boroughs Association and USDA Forest Service. 5) Provision of extension materials developed by the program (e.g., Managing Natural Resources: A Guide for Municipal Officials). 6) Provision of materials developed by others. 7) Provision of materials through newsletters, list serves, press release, and other methods. Please note that this program is a partner in the DCNR TreeVitalize Initiative and is partnering with nonprofits in the Philadelphia and Pittsburgh areas in education and outreach. The program is solely responsible, in partnership with the Bureau of Forestry, for education and outreach for the other 12 metropolitan areas in Pennsylvania (e.g., Altoona/Johnstown, State College, Erie). Through this program we offer full-day TreeTender workshops and two day Community Tree Institutes. "Linking Livestock and Renewable Energy" and the "Follow the Nutrients On-farm and Regional Digesters", both in the Manure du jour webinar series (Pennsylvania's Best Practices for Animal Agriculture, Air, and Water Quality Protection), reached 100 conservation practitioners including conservation districts, NRCS, watershed associations, state agency personnel, and municipal officials; provided training relative to greenhouse gas emissions and management from animal operations in Pennsylvania and mechanisms for manure-to-energy initiatives that have net reduction of methane emissions. Approximately 400 additional viewings of these recordings have taken place since their spring 2010 release. Fact sheets summarizing the benefits and trade-offs of on-farm and regional systems were developed and released at the National Manure Expo (July 2010) and Ag Progress Days.

Results

One hundred and sixty-five participants (79%) in the Community and Urban Natural Resources program indicated an increase in knowledge and skills that would be applied. 80% of participants in the Manure du jour sessions indicated an increased knowledge and willingness to recommend or adopt the use of digesters as a part of an on-farm system. 70% indicated that manure-to-energy integrated systems, such as the "COW POWER" program featured would have value to Pennsylvanians and farms for contributing energy to the grid and reducing reliance on fossil fuel generated energy.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
132	Weather and Climate
133	Pollution Prevention and Mitigation
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
306	Environmental Stress in Animals
605	Natural Resource and Environmental Economics

Outcome #3

1. Outcome Measures

Number of volunteers that helped with program leadership or program delivery

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1850

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

With nearly 70% of Pennsylvania's forest under private ownership, increasing the network of volunteers who can reach owners -- in urban and rural settings -- is critical. The Managing Community and Urban Natural Resources program has trained, in partnership with DCNR, 7,250 TreeTender community volunteers and 1,775 currently serve on tree commissions, municipal committees, parks and recreation planning, and support the growth and sustenance of community and urban forests. Although not yet measured in the long-term, we believe the program has impact on the ability of Pennsylvania residents and municipalities to understand and enact environmental ordinance and other public policy.

What has been done

Through the training provided, the 1,775 volunteers have helped lead and provide programs; nearly 45,000 hours of service have been recorded in support of urban and community forestry initiatives and increased tree plantings in critical areas.

Results

Volunteer capacity for the leadership of community-based programs has resulted in increasing contacts by a factor of 10.

4. Associated Knowledge Areas

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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
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Extramural Funding)

Brief Explanation

Progress on implementation of programs is contingent upon continued availability of extramural funding from a variety of public and private sources.

V(I). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- Case Study

Evaluation Results

As an emerging area, the integration of climate change into existing programs and the development of new programs will require improved evaluation that will identify pre- and post responses to information, and monitoring for long term behavioral changes that result in improved environmental outcomes.

Key Items of Evaluation

In Pennsylvania, the vernacular for climate change, its causes, and mitigating actions that individuals and institutions can undertake is evolving. Two years ago, programming was limited. Programming for this reporting year has increased and continued increases are expected.