

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

**Program # 13**

**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
102	Soil, Plant, Water, Nutrient Relationships	10%			
133	Pollution Prevention and Mitigation	20%			
205	Plant Management Systems	10%			
601	Economics of Agricultural Production and Farm Management	10%			
605	Natural Resource and Environmental Economics	20%			
608	Community Resource Planning and Development	30%			
	<b>Total</b>	100%			

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

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Actual Paid Professional	15.7	0.0	0.0	0.0
Actual Volunteer	281.0	0.0	0.0	0.0

Actual Paid Professional	15.7	0.0	0.0	0.0
Actual Volunteer	281.0	0.0	0.0	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
630221	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
681530	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**

For 2011, Wisconsin Cooperative Extension reports collaboration among the interdisciplinary Energy Conservation and Renewable Energy Team, Estuary and Coastal Wetlands Protection Team, Nutrient Management Team, Sustainability Team, colleagues and partners providing timely research-based education and assistance to adapt to and mitigate climate change impacts through developing, implementing and evaluating outreach programs to reduce carbon, nitrogen, energy and water footprints in their communities. Supporting this work is the interagency Wisconsin Initiative on Climate Change Impacts: <http://www.wicci.wisc.edu>

Nutrient Management Farmer Education (NMFE): Improving nutrient management practices improves farm profitability and reduces harmful effects of nitrogen and phosphorus on water quality. This can likewise reduce a harmful byproduct of increased flooding, by leaving less nitrogen in the soil for saturated cropland to convert to the greenhouse gas nitrous oxide. Three NMFE components -- on-farm research, training and grant funding -- intertwine to reach both farmers who seek out research-based education as well as those who lack the means to do so and can benefit the most by adopting best management practices. An interdisciplinary working group incorporates the latest on-farm research recommendations from UW-Madison, Platteville, River Falls, Stevens Point, Discovery Farms, Pioneer Farm and county agriculture agents in updating the NMFE curriculum and training interagency instructors. Price-adjusted maximum economic return on nitrogen fertilizer and Wisconsin Phosphorus Index field values are calculated using the SNAP-Plus nutrient management planning and soil loss assessment software program and new iPhone apps developed and maintained by the UW-Madison Soil Science Department. As of 2011, at least 844,500 acres of cropland and grazing land are covered under a nutrient management plan that meets all local, state and federal regulations. The farmer value is \$5.9 million for plans and \$2.1 million for tax credits.

Climate Impacts Workshops: Communities and agencies find themselves needing to adapt to immediate climate impacts and plan for future climate scenarios, yet lack local climate science and planning information. Wisconsin Cooperative Extension partnered with the National Oceanic and Atmospheric Administration, Ohio Department of Natural Resources, and Great Lakes Sea Grant Network to secure Great Lakes Restoration Initiative funding for conducting Climate Impacts Workshops modeled after workshops developed by the National Estuarine Research Reserve System. Workshop content was customized and shaped through input from local planning teams and the Wisconsin Initiative on Climate Change Impacts. In 2011, two 1-day workshops provided the latest climate science, examples of Great Lakes community vulnerabilities, climate planning processes and strategies, planning tools and resources for 126 planners and other professionals working on land use, public health, stormwater, emergency preparedness, utilities, and natural resource management issues. This same curriculum was presented at six more workshops reaching another 671 professionals and community leaders with specific climate information tailored to their disciplines and communities.

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

Wisconsin Cooperative Extension provides timely research-based education and assistance for a variety of audiences including growers and grower associations, coalitions and cooperatives, community leaders, business owners, local elected officials, town, city, county and tribal governments, plan commissions, local planning departments, school districts, economic development practitioners, and diverse individuals, youth and families. Of 26,919 adults reached through direct teaching methods in 2011, 92.6% were white, 2.4% were American Indian, 1.3% were Asian American, 1.1% were African American, and 2.7% were of other identity; 71.7% were male and 28.3% female. Of these, 3.4% (904) identified as

Latino/a, who may be of any race. Community partners and the 281 volunteers trained made additional teaching contacts.

Lake Superior National Estuarine Research Reserve: The National Estuarine Research Reserve (NERR) System is a nationwide network of protected coastal estuaries designated and supported through the National Oceanic and Atmospheric Administration. Wisconsin Cooperative Extension successfully facilitated the nomination of the St. Louis River freshwater estuary in 2009. With its designation in October 2010, the 16,697-acre Lake Superior National Estuarine Research Reserve joined Old Woman Creek (Ohio) as the second Great Lakes freshwater estuary in the NERR System.

Wisconsin Initiative on Climate Change Impacts (WICCI): This statewide collaboration brings scientists and stakeholders together to find adaptation strategies to reduce potential negative impacts of climate change in Wisconsin. WICCI issued its first comprehensive report in February 2011, Wisconsin's Changing Climate: Impacts and Adaptation. Wisconsin Cooperative Extension statewide climate specialist David S. Liebl leads the WICCI outreach effort, chairing the WICCI Outreach Committee and serving on the WICCI Science Council. WICCI's outreach program focuses on building capacity among Wisconsin decision makers to integrate climate projections into resource management decisions:  
<http://www.wicci.wisc.edu>

### 3. How was eXtension used?

Wisconsin Cooperative Extension campus and county faculty and staff participate in various communities of practice, engaging with colleagues around the country to improve the educational content of research-based programs and assistance delivered to residents across the state. Extension colleagues are connected by email ListServ, blogs and online newsletters, and shared resources such as teleconferences and webinars, eXtension Communities of Practice, and the national Extension Disaster Education Network (EDEN) to quickly address critical and emerging issues.

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

##### 1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	26919	0	0	0

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

###### Patent Applications Submitted

Year: 2011  
 Actual: 0

###### Patents listed

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

#### Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	0	4	4

#### 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	Develop, implement and evaluate outreach programs that reduce carbon, nitrogen, energy and water footprints in their communities--Nutrient Management Farmer Education
2	Develop, implement and evaluate outreach programs that reduce carbon, nitrogen, energy and water footprints in their communities--Climate Impacts Workshops

## **Outcome #1**

### **1. Outcome Measures**

Develop, implement and evaluate outreach programs that reduce carbon, nitrogen, energy and water footprints in their communities--Nutrient Management Farmer Education

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

- 1862 Extension

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

Change in Condition Outcome Measure

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

<b>Year</b>	<b>Actual</b>
2011	844500

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

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

Wisconsin farmers face increasing regulatory pressures due to agricultural nutrient contributions to Wisconsin lakes and streams, resulting in non-point source pollution including a dead zone the size of New Jersey in the Gulf of Mexico. Government agricultural programs, zoning, large farm licenses, state animal feeding operation permits and new farmland preservation tax credits all require farms to have nutrient management plans. Regulations aside, improving nutrient management practices can also improve farm profitability and water quality. This can likewise reduce a harmful byproduct of increased flooding, by leaving less nitrogen in the soil for saturated cropland to convert to the greenhouse gas nitrous oxide.

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

The Nutrient Management Team researches and updates guidelines and software to help farmers credit nitrogen from legumes and manure to save fertilizer cost and prevent loss of nutrients from fertilizers and manure to groundwater, lakes, streams and the atmosphere. Revised in 2010, the Nutrient Management Farmer Education (NMFE) curriculum combines classroom instruction, individual consultation, and on-farm field trials to engage farmers in designing nutrient management plans they can understand and follow. For a key 2010 revision to the SNAP-Plus software, NMFE curriculum and NRCS 590 Nutrient Management Standard, soil fertility extension specialist Carrie Laboski teamed with county agriculture agents for testing her corn yield response to nitrogen fertilizer protocol on diverse farms. Laboski analyzed research results and updated the nitrogen rate guidelines such that they more accurately reflect corn nitrogen needs across the wide variety of Wisconsin soils. In 2011, this was translated into the Corn N Rate Calculator app downloaded 1,003 times from September to December. This does not require Internet connection once loaded onto an iPhone or iPad--providing information in the field when needed--and will be developed for Android in 2012.

#### **Results**

Reducing the nitrogen footprint: Since 2000, an estimated 75% of the total 1,126,000 acres farmed in 51 counties by the 3,700 producers trained by Wisconsin Cooperative Extension Nutrient Management Farmer Education are now covered by a qualified nutrient management plan. As of 2011, at least 844,500 acres of cropland and grazing land are covered under a nutrient management plan that meets all local, state and federal regulations. Nutrient management (NM) plan cost is about \$7 per acre for farmer time and effort. Thus, with 844,500 acres under NM plans as of 2011 due to NMFE, the farmer benefit values at least \$5.9 million. As an added benefit, farmland preservation tax credits starting in 2010 range from \$5 to \$10 per acre and require compliance with state soil and water conservation standards, including filing NM plans. Conservatively assuming only half of the acres under NM plans as of 2011 due to NMFE claim this tax credit at the minimum \$5 per acre, the farmer benefit values at least another \$2.1 million.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
133	Pollution Prevention and Mitigation
601	Economics of Agricultural Production and Farm Management

#### Outcome #2

##### 1. Outcome Measures

Develop, implement and evaluate outreach programs that reduce carbon, nitrogen, energy and water footprints in their communities--Climate Impacts Workshops

##### 2. Associated Institution Types

- 1862 Extension

##### 3a. Outcome Type:

Change in Knowledge Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2011	797

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

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

Climate change is a complex and often debated societal issue. Despite the complexity and associated challenges, communities and agencies find themselves having to adapt to immediate climate impacts and needing to plan for future climate scenarios. As these planning processes move forward, it is important to provide professionals and community leaders with locally relevant,

science-based climate information. Information and guidance are also needed for choosing among the potential methods for incorporating evolving climate information into planning processes.

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

Wisconsin Cooperative Extension partnered with the National Oceanic and Atmospheric Administration (NOAA), Ohio Department of Natural Resources, and Great Lakes Sea Grant Network to secure Great Lakes Restoration Initiative (GLRI) funding for conducting Climate Impacts Workshops in the Great Lakes Region. The workshops were modeled after workshops developed by the National Estuarine Research Reserve System. Workshop content was customized and shaped through input from local planning teams and the Wisconsin Initiative on Climate Change Impacts (WICCI). In 2011, two 1-day workshops provided the latest climate science, examples of Great Lakes community vulnerabilities, climate planning processes and strategies, planning tools and resources for 126 planners and other professionals working on land use, public health, stormwater, emergency preparedness, utilities, and natural resource management issues. This same curriculum was presented at six more workshops reaching another 671 professionals and community leaders with specific climate information tailored to their disciplines and communities. For example, a workshop for Rock and Jefferson County planners focused on the changing risk of riparian flooding to developed areas along the Rock River.

#### **Results**

Climate Impacts Workshops: Workshop participants represented a diverse audience from local, state, and federal agencies and organizations. Participants were asked to complete both pre- and post-workshop evaluations. Based on the results, most attendees came with some understanding of general climate science and impacts, but few came with a substantial understanding of local climate science and impacts or climate adaptation planning. All areas of understanding increased after the workshops. For example, the majority of Green Bay participants (54%) rated their pre-workshop understanding of local climate science as very low or low. After the workshop, the majority (61%) rated their post-workshop understanding of local climate science as high or very high. The combined evaluation data showed that 73% of respondents learned something new that applied to their future work or decisions, and 93% indicated the workshops increased their knowledge of climate change adaptation either some (42%), a lot (34%), or a great deal (17%).

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

<b>KA Code</b>	<b>Knowledge Area</b>
133	Pollution Prevention and Mitigation
601	Economics of Agricultural Production and Farm Management
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development

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

**External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Competing Public priorities

**Brief Explanation**

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

**Evaluation Results**

{No Data Entered}

**Key Items of Evaluation**

{No Data Entered}