V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

ENVIRONMENT, WATER, LAND AND NATURAL RESOURCES

☑ 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	35%		44%	
111	Conservation and Efficient Use of Water	30%		25%	
112	Watershed Protection and Management	15%		10%	
121	Management of Range Resources	20%		21%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	11.0	0.0	21.0	0.0
Actual Paid	9.7	0.0	802.0	0.0
Actual Volunteer	0.0	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**
871014	0	826638	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
871014	0	826638	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

Water Investigations Program
Issue
With growing populations and their impacts on natural resources within the state of Arizona, critical programming has been initiated to address the future needs of the citizens and water conservation. Awareness at a young age will help to shape behaviors in understanding impacts of water usage, and mis-usage. There are many opinions as to what the future of Arizona is, but we can still anticipate record growth and the demand for natural resources. In addition, we can expect that there are going to be jobs designed to address the needs of the growing population and the skills needed to fill those jobs is something we can begin to look at currently.
What has been done
There are many tactics to address the concerns, but the Water Investigations Program (WIP) uses Science, Technology, Engineering and Math (STEM) to get students engaged with practical reasoning and problem solving. This solves two distinct purposes: 1.) It creates vast awareness on water in Arizona and helps to open that dialogue at a young age, and 2.) It provides students an avenue to get connected in the fields of STEM to solve real-world problems. The WIP used various funding to introduce ways to teach including hands-on working with water audit kits, stream water quality testing kits, macro invertebrate sampling kits, stream-flow meter, groundwater flow models and riparian area presentations. Training of volunteers and coordinators over the summer and school year help to prepare for the growing interest in the program. Over 6500 Arizona students attended three water technology presentations including one of 4 STEM Symposia, one of 118 one-hour Groundwater Flow Model Presentations, and a Water Efficiency Technology Presentation.
Sustainable Economic Development: Solar Energy
Issue
Residential construction and development is not driving Arizona's economy in the way it did in 2008. There is a glut of vacant housing, due to foreclosures, because of over entitlements granted in the mid-2000s. The future of economic development and community resiliency in Arizona will depend on a diverse economy that isn't reliant on just one sector such as housing or resource extraction--both vulnerable to boom-bust cycles. Enhancing local food systems and renewable energy are two areas that this program is assisting with to build more resilient communities that will be better prepared to weather future economic downturns.
What has been done?
Started in 2011, Renewable Energy Opportunity Analysis (REOA) was completed in 2013 to include all counties, cities and lands throughout the state. This analysis was conducted to provide decision-makers, solar developers and communities with maps and GIS shapefiles that identify the areas within their communities that are best suited for the siting of utility-scale solar facilities. The analysis used fundamental land use criteria such as the location of roads, transmission lines, substations, slope and aspect as weighted determinants of suitability. An agent with the UA College of Agriculture and Life Sciences Cooperative Extension and a professor from the UA College of Social and Behavioral Sciences) supervised the GIS modeling process as well as the creation of the maps for each region of the state. The maps are accessible online. While the aim of this effort has been to publicize the availability of these maps and data as widely as possible, the maps have also been provided to cities, counties and individuals upon request, tailored to their specific area. Most notably, in November 2014 the results of the analysis were made available to anyone with an internet connection through an interactive online mapping application: http://cals.arizona.edu/reoa/.

Impacts reported in Report Overview

2. Brief description of the target audience

Natural resource managers, Governor's Office and state agencies, municipal organizations and leaders, households, consumers, youth, master gardening and master watershed programs

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	45316	69000	12870	25000

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

Patent Applications Submitted

Year: 2014

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	148	190	338

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Effectiveness of the research program will be used to reach direct and indirect contacts

Year	Actual
2014	386

Output #2

Output Measure

- Number of individuals participating in educational programs

Year	Actual
2014	58186

Output #3

Output Measure

- Number of individuals adopting new technology

Year	Actual
2014	1500

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Effectiveness of research programs will be based on publications, external grant support, and integration into existing extension programs
2	Number of individuals gaining knowledge by participating in educational programs
3	Volunteers completing Master Gardening training
4	Create awareness and increase knowledge

Outcome #1

1. Outcome Measures

Effectiveness of research programs will be based on publications, external grant support, and integration into existing extension programs

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
All participants in the research and extension programs and the respective clientele for these programs care.

What has been done
Arizona has a fully integrated research and extension program and all faculty strongly pursue competitive grants.

Results
More than $1.5 million dollars in non-USDA grants were obtained to support this program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
121	Management of Range Resources

Outcome #2

1. Outcome Measures

Number of individuals gaining knowledge by participating in educational programs

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	12808

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
121	Management of Range Resources

Outcome #3

1. Outcome Measures

Volunteers completing Master Gardening training

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	183

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The Master Gardener program is an important component of our Cooperative Extension program.

What has been done
1,338 volunteers donated their time teaching others.

Results
Master Gardener volunteers donated over 93,900 hours in 2014.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
121	Management of Range Resources

Outcome #4

1. Outcome Measures

Create awareness and increase knowledge

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
All recipients of our programs care about increasing their knowledge.

What has been done
1,338 Master Gardener volunteers shared information directly with 22,909 program participants.

Results
The majority of the recipients consistently indicate a change in knowledge resulting from our programs and materials.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
121	Management of Range Resources

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

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

All programs are currently in the process of being evaluated externally for existing areas to preserve, protect, or enhance, as well as areas to discontinue or modify. We will continue to seek further input from stakeholders, advisory committees, and focus groups utilizing needs assessments with the assistance and expertise of an Evaluation Specialist [hire pending]. See State Defined Outcomes.

Key Items of Evaluation