

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

**Program # 7**

**1. Name of the Planned Program**

Sea Grant and Water Resources

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

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
112	Watershed Protection and Management	10%			
131	Alternative Uses of Land	20%			
133	Pollution Prevention and Mitigation	30%			
135	Aquatic and Terrestrial Wildlife	25%			
307	Animal Management Systems	5%			
903	Communication, Education, and Information Delivery	10%			
	<b>Total</b>	100%			

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

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	7.0	0.0	0.0	0.0
Actual	5.0	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
100546	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
100546	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
793080	0	0	0

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

## 1. Brief description of the Activity

### **COMMERCIAL FISHERIES**

- Hold educational workshops on the following topics:
  - Focusing efforts on reducing by-catch and increasing selectivity of fishing gear;
  - focusing efforts on reducing sea-bed impacts by mobile fishing gear;
  - facilitating cooperative research partnerships between fishermen and scientists;
  - Safety drill conductor training.
  - Welding safe practices and techniques.
  - Weather interpretation and forecasting.
  - Marine engine repair.
- Publish information sheets, technical reviews, and web pages which detail innovative fishing gears and technologies that reduce by-catch, minimize benthic impacts and enhance gear selectivity.

### **LAND AND WATER CONSERVATION**

- Provide focused training and long-term assistance to communities on natural resource planning and land conservation.
- Provide direct assistance to towns and conservation groups upon request
- Conduct land conservation and natural resources workshops and other educational activities as suggested by program staff and as requested by communities and conservation groups
- Conduct the Natural Resources Outreach Coalition program for communities selected annually.
- Develop, enhance and deliver presentations (including GIS-based) about land use/water quality to local decision makers
- Facilitate community meetings to develop action plans for implementing water and natural resource based planning

### **COASTAL ECOSYSTEM HEALTH AND COMMUNITIES**

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- Broadcast educational messages over low power radio (Great Bay Area Radio) to motorists about the estuary, research, educational opportunities and Sea Grant.
- Conduct at least 5 activity-based Great Bay Discovery Cruises.
- Provide information to communities and development professionals to encourage the use of more innovative stormwater management.
- Produce printed, presentation, web and other educational materials

### **MARINE SCIENCE EDUCATION**

- Review and revise existing programs and curriculum materials to support teaching core science standards through a marine context
- Develop new marine education K-12 Sea Trek programs that reflect emerging national scientific issues and address prioritized education standards
- Expand our programs and materials that target adult audiences and recruit and train a cadre of Docents specifically for that role
- Develop programs focused on high school level teachers and students that provide exposure to marine research and encourage students to pursue marine fields in college and beyond
- Develop convenient and effective teacher training in conjunction with all boat-based and field programs utilizing both face-to-face and remote methods
- In partnership with schools and UNH, develop new programs that engage in-service and pre-service teachers directly with researchers, faculty, and graduate students

### **WATER QUALITY**

- Hold water quality monitoring training sessions for new and existing volunteers - conduct field visits for in-depth monitoring and quality assurance
- Provide analytical services, data base management and data analysis for Great Bay Coastal Watch and NH Lakes Lay Monitoring Program collected samples
- Produce annual lake reports and coastal reports on water quality assessments from volunteer

monitoring efforts

- Hold regular meetings of the monitors to provide program updates, advanced monitoring technique trainings and data interpretation/presentation skill building. Also conduct needs assessment and evaluation
- Provide data and data interpretation as requested by decision-makers, cooperators and watershed stakeholder groups

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

Commercial fishermen and related industries; land owners and recreational users of New Hampshire's lakes, estuaries, rivers, and ocean beaches; Formal and non-formal educators and K-12 students; policy and decision makers

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

**1. Standard output measures**

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Plan</b>	1700	50000	0	0
<b>Actual</b>	1272	0	0	0

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

**Patent Applications Submitted**

Year: 2010  
 Plan: 0  
 Actual: 0

**Patents listed**

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

**Number of Peer Reviewed Publications**

2010	Extension	Research	Total
<b>Plan</b>	0	0	
<b>Actual</b>	0	0	0

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

**Output Target**

**Output #1**

**Output Measure**

- Number of activity-based Great Bay Discovery Cruises provided to citizens with the opportunity to learn about the estuary aboard the University's research vessel  
Not reporting on this Output for this Annual Report

**Output #2**

**Output Measure**

- Number of motorists passing by the Great Bay estuary exposed to a low power radio station (Great Bay Area Radio) dedicated to informing them with recorded messages on natural history, research, educational opportunities and Cooperative Institute for Coastal and Estuarine Environmental Technology (CICEET)  
Not reporting on this Output for this Annual Report

**Output #3**

**Output Measure**

- Number of water quality monitoring training sessions held for new and existing volunteers

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	2	11

**Output #4**

**Output Measure**

- Number of annual lake reports and coastal reports published on water quality assessments from volunteer monitoring efforts

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	5	6

**Output #5**

**Output Measure**

- Number of new volunteers trained in proper water quality sampling methods and who participate in seasonal sampling as part of the Great Bay Coastal Watch or Lakes Lay Monitoring Program

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	10	10

**Output #6**

**Output Measure**

- Number of hours NH Lakes Lay Monitoring Program volunteers contribute toward conducting water quality monitoring and analysis activities in their local watersheds

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	8500	5087

**Output #7**

**Output Measure**

- Number of towns and conservation groups provided with direct assistance regarding land and water conservation

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2010	20	17

**Output #8**

**Output Measure**

- Number of new marine education K-12 Sea Trek programs that reflect emerging national scientific issues and address prioritized education standards  
Not reporting on this Output for this Annual Report

**Output #9**

**Output Measure**

- Number of marine science education programs focused on high school level teachers and students that provide exposure to marine research and encourage students to pursue marine fields in college and beyond  
Not reporting on this Output for this Annual Report

**Output #10**

**Output Measure**

- Number of guides developed to existing curricular and program materials that identify how the marine context can be used to address core content standards  
Not reporting on this Output for this Annual Report

**Output #11**

**Output Measure**

- Number of convenient and effective teacher training programs held in conjunction with all boat-based and field programs utilizing both face-to-face and remote methods  
Not reporting on this Output for this Annual Report

**Output #12**

**Output Measure**

- Number of new programs developed in partnership with schools and UNH, that engage in-service and pre-service teachers directly with researchers, faculty, and graduate students  
Not reporting on this Output for this Annual Report

**Output #13**

**Output Measure**

- Number of NROC communities provided with water resource/water quality related technical assistance

<b>Year</b>	<b>Target</b>	<b>Actual</b>
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2010 2 2

**Output #14**

**Output Measure**

- Number of educational workshops for commercial fishermen on the following topics: \* Focusing efforts on reducing by-catch and increasing selectivity of fishing gear; \* Focusing efforts on reducing sea-bed impacts by mobile fishing gear; \* Facilitating cooperative research partnerships between fishermen and scientists.

Year	Target	Actual
2010	8	48

**Output #15**

**Output Measure**

- Number of published information sheets, technical reviews, and web pages which detail innovative fishing gears and technologies that reduce by-catch, minimize benthic impacts and enhance gear selectivity.

Year	Target	Actual
2010	7	8

**Output #16**

**Output Measure**

- Number of Safety-at-Sea programs held.

Year	Target	Actual
2010	2	1

**Output #17**

**Output Measure**

- Number of homeowners provided with information about home and yard care practices that prevent or minimize contamination of water resources via runoff.

Year	Target	Actual
2010	100	320

**Output #18**

**Output Measure**

- Number of communities and development professionals provided information to encourage the use of more innovative stormwater management.  
Not reporting on this Output for this Annual Report

**Output #19**

**Output Measure**

- Number of fishermen trained in safe welding practices  
Not reporting on this Output for this Annual Report

**V(G). State Defined Outcomes****V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	Number of adults and children with a measurable increase in their marine science literacy through specialist and volunteer delivered outcome-based, formal and informal education programs
2	Number of fishermen who choose non-mandatory conservation-minded gear over traditional equipment
3	Number of cooperative research proposals submitted involving scientists and fishermen that focus on reducing benthic impacts of mobile fishing gear are submitted to appropriate programs/agencies
4	Number of fishermen who choose soft-bottom fishing gear over traditional equipment
5	Number of fishermen who successfully complete cooperative research projects
6	Number of communities to develop action plans that include a variety of approaches for making progress in community-based natural resource protection projects.
7	Number of K-12 teachers who adopt marine science concepts and contexts learned through Sea Grant /UNHCE programs that support teaching of core sciences and other content standards
8	Number of K-12 students who improve performance in content areas as a result of teachers incorporating marine science into their lesson plans
9	Percent of new or existing volunteer monitoring programs that request assistance and then initiate enhanced or expanded program efforts due to assistance provided by the project
10	Number of fishermen who gain knowledge increase knowledge of new conservation fishing gear that reduces benthic habitat impact.
11	Number of fishermen who become certified as safety drill conductors.
12	Number of communities to implement or start to implement a natural resource protection project.
13	Number of community decision makers, conservation groups or development professionals who report gaining knowledge about preventing degradation from storm water runoff.
14	Number of community decision-makers and Coverts Cooperators who identify actions they will take to conserve the state's biodiversity.
15	Percent of water quality program participants who indicate an increase in knowledge on the impacts development has on water quality.
16	Number of participating organizations each year that will embark on extensive monitoring/management efforts in their watersheds.

**Outcome #1**

**1. Outcome Measures**

Number of adults and children with a measurable increase in their marine science literacy through specialist and volunteer delivered outcome-based, formal and informal education programs

Not Reporting on this Outcome Measure

**Outcome #2**

**1. Outcome Measures**

Number of fishermen who choose non-mandatory conservation-minded gear over traditional equipment

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	5	15

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
135	Aquatic and Terrestrial Wildlife

**Outcome #3**

**1. Outcome Measures**

Number of cooperative research proposals submitted involving scientists and fishermen that focus on reducing benthic impacts of mobile fishing gear are submitted to appropriate programs/agencies

Not Reporting on this Outcome Measure

**Outcome #4**

**1. Outcome Measures**

Number of fishermen who choose soft-bottom fishing gear over traditional equipment

Not Reporting on this Outcome Measure

**Outcome #5**

**1. Outcome Measures**

Number of fishermen who successfully complete cooperative research projects

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	5	16

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
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- 307 Animal Management Systems
- 903 Communication, Education, and Information Delivery

**Outcome #6**

**1. Outcome Measures**

Number of communities to develop action plans that include a variety of approaches for making progress in community-based natural resource protection projects.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	10	16

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

**Issue (Who cares and Why)**

**What has been done**

Extension's Land & Water Conservation Program assists New Hampshire communities and conservation groups with land and water conservation planning projects, including natural resources inventories, conservation planning, land protection, public outreach, and building public support. During the reporting period, assistance was provided to 15 towns and two conservation groups and participated in 12 statewide meetings. Direct assistance to communities, workshops and courses involved total participation of 765 participants. Publication of the Taking Action for Wildlife e-newsletter 3 times/year reaches more than 1,300 people with each issue.

**Results**

Improved Information Gathering and Research: These actions help provide local data and information upon which rational conservation decisions can be based.

Fourteen communities (Barrington, Brentwood, Danville, East Kingston, Fremont, Lempster, Nelson, Nottingham, Rochester, Seabrook, Sandown, Stoddard, Wakefield, Washington), two conservation groups (Lamprey River Watershed Association and Bear Paw Regional Greenways) and participants at 12 statewide events improved their background knowledge for future decision making about natural resources protection.

247 participants at the 9th Annual Saving Special Places Conference increased their knowledge of a variety of land conservation and stewardship issues. This annual event is co-sponsored and organized by UNHCE, the Society for the Protection of NH Forests, and the Natural Resources Conservation Service.

60 participants at three Taking Action For Wildlife workshops learned information about wildlife

habitat conservation to incorporate into their conservation planning.

?Through the Natural Resources Outreach Coalition (NROC) community assistance, the Lamprey River Watershed Association conducted several public outreach sessions, successfully submitted a nomination packet for inclusion of the Lamprey River in the State Rivers program and revised their strategic plan.

?Revision and update of the Method for Evaluating Freshwater Wetlands in New Hampshire.

?Development of Taking Action for Wildlife web pages, a joint effort between UNHCE and NH Fish & Game.

**Better Planning for Natural Resources Protection:** Through the Taking Action for Wildlife program, six communities (Fremont, Sandown, Lempster, Washington, Nelson and Stoddard) used information from NH's Wildlife Action Plan in their natural resources inventories and conservation plans. Nelson contacted eight landowners to gauge their interest in land conservation with personalized calls and wildlife information packets. Lempster is developing a natural resources inventory and conservation plan that includes a focus on wildlife. Washington is collaborating with Lempster on land conservation projects along the town boundaries.

**Enhanced Policies and Regulation:** Through the NROC program, Newmarket applied for and received a grant to hire a consultant to help them develop improved stormwater measures in their subdivision and site plan review regulations.

**Progress from Decisions to Actions:** As a result of Taking Action for Wildlife, Fremont, Sandown and Danville applied for and received a grant to hire a biologist to inventory the wildlife habitats in the three adjacent communities along the Exeter River. The three communities are conducting public outreach efforts to publicize the project. Fremont is planning a plant and wildlife bio-blitz event for the public in spring 2011. Bradford conducted a public outreach event focused on their Natural Resources Inventory and NH Wildlife Action Plan information.

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

<b>KA Code</b>	<b>Knowledge Area</b>
112	Watershed Protection and Management
131	Alternative Uses of Land
133	Pollution Prevention and Mitigation

#### **Outcome #7**

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

Number of K-12 teachers who adopt marine science concepts and contexts learned through Sea Grant /UNHCE programs that support teaching of core sciences and other content standards

Not Reporting on this Outcome Measure

**Outcome #8**

**1. Outcome Measures**

Number of K-12 students who improve performance in content areas as a result of teachers incorporating marine science into their lesson plans

Not Reporting on this Outcome Measure

**Outcome #9**

**1. Outcome Measures**

Percent of new or existing volunteer monitoring programs that request assistance and then initiate enhanced or expanded program efforts due to assistance provided by the project

Not Reporting on this Outcome Measure

**Outcome #10**

**1. Outcome Measures**

Number of fishermen who gain knowledge increase knowledge of new conservation fishing gear that reduces benthic habitat impact.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	30	76

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

**KA Code    Knowledge Area**

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135 Aquatic and Terrestrial Wildlife

**Outcome #11**

**1. Outcome Measures**

Number of fishermen who become certified as safety drill conductors.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	10	23

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
903	Communication, Education, and Information Delivery

**Outcome #12**

**1. Outcome Measures**

Number of communities to implement or start to implement a natural resource protection project.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	2	15

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

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
112	Watershed Protection and Management
131	Alternative Uses of Land

**Outcome #13**

**1. Outcome Measures**

Number of community decision makers, conservation groups or development professionals who report gaining knowledge about preventing degradation from storm water runoff.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2010	12	246

**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>
112	Watershed Protection and Management

**Outcome #14**

**1. Outcome Measures**

Number of community decision-makers and Coverts Cooperators who identify actions they will take to conserve the state's biodiversity.

Not Reporting on this Outcome Measure

**Outcome #15**

**1. Outcome Measures**

Percent of water quality program participants who indicate an increase in knowledge on the impacts development has on water quality.

Not Reporting on this Outcome Measure

**Outcome #16**

**1. Outcome Measures**

Number of participating organizations each year that will embark on extensive monitoring/management efforts in their watersheds.

**2. Associated Institution Types**

- 1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2010	3	6

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

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

The fresh waters of New Hampshire represent a valuable resource contributing to the State's economic base through recreation, tourism, real estate revenues and taxes. In addition some lakes and rivers serve as current or potential drinking water reservoirs/supplies. For most residents our generally pristine waters help to insure a high quality of life. However, New Hampshire currently leads all of the New England states in the rate of new development and redevelopment. The long-term consequences of the resulting pressure and demands on the state's precious water resources remain unknown. Of particular concern is the response of our waters to increasing non-point source pollutant loading due to watershed development and land use activities. Local citizens, lake/watershed associations and local decision-makers remain in dire need of additional information required for the intelligent management of our water resources on the local level. State agencies need to be better informed on water quality changes and trends. Limited financial resources do not allow for adequate monitoring of these waters by state or federal agencies, and the increased development and recreational use require a more accurate assessment of the water quality conditions of our estuaries, lakes, ponds, rivers and streams.

### **What has been done**

The NH Lakes Lay Monitoring Program (NH LLMP) that is supported by UNH Cooperative Extension and co-administered by UNH CE and the UNH Center for Freshwater Biology (CFB; College of Life Science and Agriculture) offers a cost-shared, quality assured water quality monitoring and assessment program taking advantage of the commitment of local residents to serve as volunteer monitors. For over thirty years in some cases we have worked with towns and local lake and watershed associations throughout the state providing monitoring and water quality assessment assistance. Over 100 lakes and over 350 tributary streams in NH, and a few lakes in Maine and Massachusetts have been monitored. The water quality data collected by volunteers provides the information needed for condition assessment as well as the establishment of baseline condition to evaluate the impacts of development, re-development and various land uses/land covers have on water quality. Through training sessions, workshops and quality assurance visits UNH extension faculty and students work with the volunteers to teach them methods for sampling, sample processing and measurement with the result being high quality data collected on a timely basis to detect both problematic situations, that can be addressed early-on to mitigate the damage, and long-term trends.

### **Results**

1. Ossipee Watershed. Output: Continued to assist in program design/modifications and water quality analysis for the Saco River monitoring program of the Green Mountain Conservation Group. Outcome: This has promoted stronger multijurisdictional (Maine and NH) watershed collaboration and prompted efforts to secure additional grant funding to further assess surface and groundwater impacts. The NH LLMP is currently assisting the GMCG in developing a proposal to create a Watershed Management Plan for the Ossipee Watershed (Carroll County and Maine)
2. Newfound Lake Watershed. Output: Continued to collect data for a water/nutrient budget on Newfound Lake as part of a collaborative effort to designate Newfound Lake as a state "High Quality Water" that includes representation from Plymouth State University, Newfound Lake Region Association, Society for the Protection of New Hampshire Forests, Jeffrey Taylor and Associates, local towns, etc. In 2010 we expanded the water quality monitoring program and trained new volunteer monitors who initiated headwater stream sampling in 2010 with project partners that included GIS mapping assistance by the Society for the Protection of New Hampshire Forests. Outcomes: Community meetings for establishing buy-in of setting outstanding resource water status were provided with monitoring results and lake assessment information in order to make an informed choice. An additional 319 grant was awarded to support the

implementation of the Newfound Lake Watershed Management Plan.

4. Acton ME/Wakefield NH Output: Continued to assist in expanded lake monitoring programs and assessments. Outcome: Working with local volunteers, we collected water quality data that will be used to track water quality changes and to help generate phosphorus loading thresholds that will sustain high quality waters (participating lakes include: Horn Pond, Great East Lake, Lovell Lake and Lake Ivanhoe; Carrol County).

5. Mirror Lake (Tuftonboro). Outcome: Using existing data on lake water quality and cyanobacteria blooms we assisted the Mirror Lake Protective Association with expanded water quality monitoring aimed at better understanding watershed phosphorus sources and potential mitigation strategies in association with funding received.

6. Winnepesaukee. Output: Assisted the Lake Winnepesaukee Watershed Partnership in expanding Lake Winnepesaukee water quality sampling to better characterize the current conditions of Meredith Bay, Governor's Island, Saunders Bay and Paugus Bay. Outcome: Current and historical data are being used to manage phosphorus loading through an integrated science based land use planning process. NH DES has selected this collaborative to perform similar analysis and community engagement for Center Harbor and Moultonboro areas of the lake.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

#### 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
- Populations changes (immigration, new cultural groupings, etc.)

##### Brief Explanation

{No Data Entered}

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

##### 1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)

## **Evaluation Results**

### **Key Items of Evaluation**