

GOAL 1: AN AGRICULTURAL SYSTEM THAT IS HIGHLY COMPETITIVE IN THE GLOBAL ECONOMY.

PROGRAM 1: LANDSCAPE HORTICULTURE AND TECHNOLOGY FOR SUSTAINABLE AGRICULTURE.

Overview: Rhode Island's AES and CE programs in agricultural system management emphasize the green industries (turfgrass and ornamental horticulture) of this state because of their relative importance. It is possible for us to address the needs of the state in a coordinated program of research and outreach that covers plant production, landscape design, landscape use, installation, and maintenance. Thus we have the potential to directly impact the green industry professionals, the homeowners, and all citizens and visitors utilizing managed landscapes (parks, ball fields, and golf courses) throughout the state. Our focus is to maintain an economically viable industry with environmentally benign practices. This program includes specific regional efforts such as organizing New England GROWS, and the New England Turfgrass Conference and Show.

Key to the future of the Program is the progress of the University's Environmental Biotechnology Initiative, an ambitious, faculty-led effort to secure core state-of-the-art facilities for plant and animal genomics, transgenics, imaging, and bioinformatics. Progress on advancing a building toward a State Bond Referendum on the 2004 bond issue has been positive.

Key Theme—Invasive Species:

Research into the area of invasive species is covered by Hatch project RI00663 'Biological Control of Invasive Plants and Insects in Rhode Island.'

Milestones:

- The Rhode Island Invasive Species Council Plant and Animal committees met several times to continue assessing invasive and potentially invasive organisms in Rhode Island. The Plant Committee is compiling a list of invasive plants, and the Animal Committee is focused on how to assess non-native invertebrates in the state.
- Research data indicate that the exotic ladybug *Harmonia axyridis* may be inhibiting our efforts to control the hemlock woolly adelgid with *Pseudocymnus tsugae*.

Outputs/Outcomes/Impacts:

- On January 24, 2001, Lisa Gould participated in the annual meeting of the Rhode Island Nursery and Landscape Association (RINLA) on a panel *Invasive Plant & Sustainable Plants Issues*. Lisa Gould also met with representatives from RINLA Executive Board on 9/11/01, at URI's W. Alton Jones Campus, to discuss the issue of invasive species and show the RINLA Board in-the-field examples of invasive landscape plants.
- RIISC sponsored a talk by Chris Mattrick, Senior Conservation Programs Manager of the New England Wild Flower Society, on *Management of Invasive Plant Species: the*

Consequences of Control, on January 16, 2001, at URI. Approximately 60 people attended.

- Participated in a regional coalition, the New England Invasive Plant Group (NIPGro), organized by the U. S. Fish & Wildlife Service. The group met on October 4, 2000, and on March 1, 2001, Lisa Gould participated in a regional [New England/New York] "Share Fair" on invasive species, sponsored by NIPGro, entitled *Maximizing Our Efforts: Sharing Invasive Species Outreach Materials and Strategies* and held at UMass-Amherst.
- Findings from the research is leading scientists to conduct more outreach with local nurserymen, in an attempt to promote native plant species as landscape plants, rather than non-native species such as the hemlock which is subject to the woolly adelgid.

Source of funds: AES, CE, industry groups

Scope of impact: state specific

Key Theme—Emerging Infectious Diseases:

Overview: The vector-borne and zoonotic diseases program includes our projects on zoonotic disease surveillance and management and on biological control of tick and mosquito vectors. Key elements of the program continue to focus on i) enhancing surveillance, ii) improving diagnostics, iii) gaining knowledge on vector-pathogen interactions, and iv) developing and implementing vector control strategies that are appropriate for communities. They represent an important capacity for research and outreach in vector-borne and other zoonotic diseases that is critical for protecting animals and humans in Rhode Island and throughout the northeastern region. Moreover, ongoing surveillance for disease agents and continued development and implementation of rational vector-borne disease management plans are key elements for a public health approach to bioterrorism preparedness.

We maintain close ties with the Rhode Island Office of Mosquito Abatement Coordination and the Rhode Island Department of Health, and collaborate by providing specialized pathogen testing facilities in our BL-3 laboratory, and by maintaining a statewide tick surveillance effort. We provide expertise and capacity for a wide variety zoonotic diseases, including Lyme disease, Babesiosis, human ehrlichiosis (HGE), West Nile Virus, EEE, and other diseases of major public concern.

Hatch projects focused on infectious diseases include RI 00664 'Developing Vector-borne Disease Watch-Warning Systems and Responses for the Northeastern U.S.', RI00884 'Tick Hemocytes as Antigens for a Vaccine Against *Amblyomma Americanum*,' RI00545 'Enhancing Zoonotic Disease Surveillance and Management in Rhode Island,' and RI00660 'Biological Control of *Ixodes Scapularis* in Rhode Island.' This theme area was further supported by NRI Equipment Grant RI-2000-01163 'Refrigerated Superspeed Centrifuge and Rotors for Basic Laboratory Research,' which provided funding to buy a new centrifuge.

Milestones:

- Continued surveillance of ticks and tick-borne pathogens throughout RI. Vector abundance was just 15% higher than during the previous reporting period (1999-00).

- Found a close correlation between June-July precipitation amounts and nymphal tick abundance.
- Continued surveillance for WNV and EEE. Although we recovered just 2 confirmed positive WNV mosquito pools, incidence of wild bird positivity for the virus doubled from the previous year.
- Recovered WNV from 61% of 341 dead birds collected in RI. Crows and blue jays made up 98.6% of all WNV positive birds.
- Found three genetic variants of the HGE agent, recently renamed *Anaplasma phagocytophila*. Experimental studies showed that the predominant variant (variant 1), found in up to 50% of all GE infected ticks, is not infectious to white footed mice, a principal reservoir of the HGE agent.
- Identified high rates of *Toxoplasma gondii* infection in RI cat populations but relatively low rates of infection among wild rodents. 42% of 200 cats screened exhibited antibodies to this parasite.
- Identified several potential tick salivary molecules to serve as potential anti-tick feeding vaccine candidates.
- Surveyed mosquito species and viral infection at 16 national park sites in the eastern U.S.
- Provided technical advice on mosquitoes and West Nile Virus to the National Park Service, U.S. Fish And Wildlife Service, the Nature Conservancy and for the State of Rhode Island (DEM/DOH West Nile Virus Advisory Committee).
- A Sorvall Superspeed refrigerated centrifuge (Model RC-5C Plus) and rotors were purchased on Jan. 10, 2001 with USDA funding to conduct experiments in support research projects to investigate the physiology of *Borrelia burgdorferi*, the causative agent of Lyme disease.

Outputs/Outcomes/Impacts:

- Mosquito surveillance results were used to direct mosquito suppression efforts in RI for the 2001 season. There were no human or horse cases of WNV reported in RI during 2001.
- Surveillance of small mammals for *T. gondii* infection suggests that feral cats may be more significant in perpetuating a cat-mouse infection cycle than owned cats.
- Dead bird surveillance for WNV indicates an increasing incidence and spread of virus in native bird populations but may not be useful for indicating human risk for infection.
- The correlation between summer precipitation amounts and tick abundance suggests

the possibility of developing a weather-based predictive model for tick-borne disease region-wide.

- Station research findings present the RI Department of Environmental Management with crucial data used to determine tick and mosquito abatement needs, such as spraying needs and locations most needing abatement.

Source of funds: AES, CE, grant

Scope of impact: state and regional

Key Theme–Biotechnology:

Overview: Biotechnology is pervasive throughout our research portfolio. The critical issue is to make progress in development of core infrastructure for genomics, transgenics, imaging, and bioinformatics. NRI Equipment grants, RI00200103137 ‘Confocal Scanning Microscopy for Environmental Biotechnology,’ and RI-2000-001142 ‘Equipment Request to Strengthen Basic Infrastructure for Plant Biology Research at URI,’ have furthered this important research area. In addition, there is a growing body of USDA-funded research projects involved in this area, including NRI grants RI001999901385 ‘A Genetic Dissection of the Sex Determination Pathway in Maize,’ RI-2000-01228 ‘Enhancing Kentucky Bluegrass Forage Quality Through Physiological and Molecular Approaches,’ and RI002001-00966 ‘Stable Expression of Yeast FLP Site Specific Recombinase in Rice.’

Milestones:

- USDA funding of a controlled environment growth chamber (Convion plant growth chamber model PGR15) was obtained, and this machine will be purchased during 2002 to strengthen the infrastructure at URI for plant biology research. The chamber will be used to maintain turfgrass plants that are part of a Station research program to enhance important traits of turfgrass species using modern gene transfer technologies based on microprojectile bombardment and *Agrobacterium tumefaciens*.
- Six Kentucky bluegrass clones with variable nitrate uptake rates and leaf nitrate reductase activities have been studied. Using an in vivo method, nitrate reductase activity in leaves during the day/night cycle. Findings were that the optimum pH for the daytime activity and nighttime activity was significantly different, indicating that one isoenzyme of nitrate reductase may be at work predominately during the day and another predominately during this night.
- By understanding the process of sex determination in maize and eventually cloning the critical genes, it will be possible to engineer rice, wheat and other grasses to produce unisexual flowers.

Key Theme–Ornamental/Green Agriculture:

Overview: We have several projects addressing the owners, designers, and managers of landscapes as well as those producing ornamental plants. These include multi-state research projects NE-009 ‘Conservation and Utilization of Plant Genetic Resources,’ NE-187 ‘Best Management Practices for Turf Systems in the East,’ and S-290 ‘Technical and Economical Efficiencies of Producing, Marketing, and Managing Environmental Plants.’ The URI Cooperative Extension GreenShare Program is a partnership between the University and the

green industries. URI CE faculty and staff provide training for green industry professionals and together the two groups work to provide scientifically-based horticultural information to the gardening public.

Milestones:

- Conducted 56 site visits with nursery and landscape firms, processed 104 foliar and soil samples, and initiated 5 research projects to address grower issues including: poor flower color development on Hydrangea, pH/nutrient problems on 5 crops, poor drainage of potting medium, and effects of planting depth on landscape plant survival.
- Presented 14 seminars and developed 5 fact sheets for distribution to green industry personnel and clients.
- Two web sites were maintained and expanded. One of these, the “Sustainable Plant List” www.uri.edu/research/sustland/ exceeded 55,000 visits. Nearly 600 hard copies of the sustainable plant list were distributed, and 750 copies of the revised “Rhode Island Nursery Stock Source List” were distributed to green industry professionals.
- Developed new practice for water resources assessment and protection to improve the success of water quality remediation practices by designing constructed wetlands which more efficiently reduce pollutants in runoff from agricultural sources.
- Located and increased germplasm of cold-hardy and salt-tolerant conifers to replace existing populations threatened by insect and disease problems.
- From Roger Williams Park Botanical Gardens in RI’s urban center to the Cross Mills Historic School House in rural South County; 245 URI Cooperative Extension Master Gardeners contributed over 14,000 volunteer hours this year at 50 URI Master Gardener projects while spreading the Cooperative Extension message of environmentally-sound home and garden practices.
- This year, over 3,000 school children learned about Rhode Island's soils, plants, wildlife and water through hands-on activities while attending the Cooperative Extension Education Center's Learning Landscape Environmental Education Program and the Eco-exploration Program held in the URI gardens and greenhouses. Currently, through a grant from the RI Department of Environmental Management, the ABC’s of integrated pest management, an interactive website for elementary schools will be piloted with school groups who participate in the Learning Landscape program.
- URI Cooperative Extension Master Gardener volunteers answer over 11,000 calls each year from Rhode Island citizens through the toll-free URI CE Gardening and Food Safety Hotline.
- Over 100,000 Rhode Islanders each week tune into URI Cooperative Extension's Plant Pro segments on WJAR News Channel 10. Filmed in the URI Learning Landscape and Greenhouses, the segments emphasize environmentally-friendly gardening tips for both backyard and professional gardeners.
- Growing Green, a monthly URI Cooperative Extension GreenShare horticultural column in the Providence Journal, reaches over 175,000 Rhode Island households.
- Each fall, over 3,000 Rhode Islanders attend the URI Cooperative Extension GreenShare Field Day, a horticultural and environmental festival held in the URI Learning Landscape Gardens. The field day features garden tours, demonstrations,

activities for kids, food and music. Now in its twelfth year, the festival has become an eagerly awaited event each year.

- Annually, 130 Rhode Islanders complete a 16-week URI Master Gardener basic training program. Classes are taught by faculty, staff and members of the Green Industry. After successfully completing the course, approximately 50% of the participants go on to complete a 50-hour internship and become certified URI Master Gardener volunteers.

Outputs/Outcomes/Impacts

- During the 2001 gardening season, over 300 Rhode Islanders submitted plant and insect samples to the URI Cooperative Extension Plant Protection Clinic for diagnosis and appropriate treatment recommendations. We also processed over 250 samples of turf from around the country for disease diagnosis and control recommendations, including recommendations for disease-resistant species.
- Both commercial nurseries and homeowners are now getting much more effective deer protection of landscape plants.
- We provided Pesticide Applicator Training to over 500 commercial applicators each year and 2,000 applicator recertification training, general public and Master Gardener training through categories 3a and 3b Turfgrass and Ornamentals Certification training.

Source of funds: AES, CE, industry-sponsored grants

Scope of impact: state specific

Key Theme—Integrated Pest Management (including Biological Control):

Overview: This includes the RI IPM program (also covered under the Ornamental/Green Agriculture theme) as well as research projects on Biological Control in Rhode Island, a multi-state project NE-171 'Biologically Based IPM Systems for Management of Plant-Parasitic Nematodes,' and NRI grant RI00-2000-04129 'Parasitoid Evaluation: A New Paradigm.'

Milestones:

- We demonstrated that the addition of glucose to saturated soil controlled plant parasitic nematodes through the action of fermentative bacteria.
- We initiated experiments with butyric acid and parasitic fungi (*Rhizoctonia fragariae*) as a preplant treatment for plant parasitic nematodes.
- Purple loosestrife at Roger Williams Park Zoo was defoliated for the fourth consecutive season by biological control agents we released and native plants are returning to the site.
- Cypress spurge has been brought under complete control at one farm in RI we have redistributed biological control agents to 8 additional farms in RI.
- We have discovered 6 European parasitoids of the lily leaf beetle and released one of them (*Tetrastichus setifer*) in Boston, MA against this pest.
- We have identified key natural enemies of *Phragmites australis* in both the US and Europe

- We released *Pseudoscymnus tsugae*, the Japanese predator of the hemlock woolly adelgid on infested trees in a landscape setting. Based upon 3 seasons' work, it appears that *Pseudoscymnus tsugae* has little potential to control the hemlock woolly adelgid in landscape settings.
- We scouted 10 commercial apple orchards and disseminated pest management information to these and all other growers through recorded telephone messages and an apple IPM website.
- We organized 4 grower meetings and a summer tour to highlight effective IPM practices.
- Completed host specificity and competition tests of ichneumonid parasitoids of the lily leaf beetle and applied to USDA for release permits for two species.
- We have begun to identify native and exotic stands of *Phragmites australis* in Rhode Island and to characterize insect populations on them.
- Screening various nematode species and pathogenic fungi for sensitivity to butyric acid continues to show promise.

Outputs/Outcomes/Impacts:

- Both glucose and butyric acid hold promise as biorational alternatives to synthetic fumigants.
- It appears that the biological control agents that we have released against purple loosestrife and Cypress spurge have locally controlled these pests and they are well established and spreading.

Source of funds: AES, CE

Scope of impact: Massachusetts and Rhode Island

PROGRAM 2: AQUACULTURE BIOTECHNOLOGY AND FISHING.

Overview: A new thrust of the program is related to aquaculture nutrition, particularly the search for replacements for fish meal, which is expensive and in somewhat limited supply. A project begun in 2001 examines the use of waste material from the processing of squid. This project studies techniques to transform that waste material into a usable source of protein or fish diets.

AES and CE-supported projects are spawning externally-funded companion projects, including successful projects under the Northeast Regional Aquaculture Center (NRAC), and collaborations with the private sector. 2001 saw continued investment in building laboratory capacity for physiological stress and disease studies, and the completion of a major retrofitting project to allow us to work on vaccine development and disease challenges.

Construction on a new USDA-funded marine aquaculture facility at the Narragansett Bay campus will begin in 2002, creating major new opportunities for state-of-the-art research. With this facility we will be able to develop appropriate biotechnological approaches to two areas of concern—fish and shellfish genomics and transgenics for stock

improvement and disease recognition and vaccine development.

An encouraging aspect of this effort is the success of private companies that are now moving into Rhode Island for research or production, affiliations that began with University ties. Cape Aquacultural Technologies has signed an agreement with the Rhode Island Economic Policy Council, through the Samuel Slater Center of Excellence in Environmental Biotechnology, to collaborate in an on-campus research project on fish genomics, and is now setting up. CAT was attracted to Rhode Island by collaborations with Dr. Terry Bradley, whose work is outlined below. Great Bay Aquaculture is expanding its New Hampshire production into Rhode Island by setting up a flounder facility at Quonset Point. Great Bay has established research and outreach ties with Dr. David Bengtson and other URI researchers.

Key Theme–Aquaculture:

Overview: Research in this theme area is a result of NRI grants RI0019903421 ‘Molecular Mechanisms of Osmoregulation in Salmon,’ RI00199903266 ‘Improving Flounder Productivity Through Enhanced Growth,’ and RI-2000-01264 ‘Feed-Based Delivery of Recombinant Anti-microbial Peptides for Shellfish Aquaculture.’ Hatch projects include RI00401 ‘Vaccine Development for Bacterial Pathogens: The Nutrient Approach,’ RI00883 ‘Molecular Probes for Heat Shock Proteins for Salmonid Fishes,’ RI00886 ‘Bivalve Aquaculture to Control Estuarine Eutrophication,’ and RI0085 ‘Comprehensive Utilization of Squid Processing Waste for Aquaculture Feed Development.’ In addition, Multistate project NE-165 ‘Private Strategies, Public Policies and Food System Performance,’ focuses on seafood trade and marketing.

Milestones:

- Identification of partially hydrolyzed proteins believed to be a contributing factor to an optimum nutrition for fish growth.
- Discovered that consumers in both the U.S. and Norway are inclined to buy ecolabeled (sustainably managed) seafood, even if prices for the labeled products are higher than the non-labeled.
- Estrodiol immersion has effects on gender of summer flounder.
- Heat shock proteins in Atlantic salmon were induced by hyperosmotic stress (e.g., transfer from fresh to salt water), but not by routine hatchery procedures (e.g., crowding, handling, etc.). Thus, these proteins are probably not good markers of hatchery stress.
- A Sorvall Superspeed refrigerated centrifuge (Model RC-5C Plus) and rotors were purchased on Jan. 10, 2001 with USDA funding to conduct experiments in support of a research project to examine the regulation of virulence genes in *Vibrio anguillarum*, the causative agent of vibriosis in fish.
- Laboratory tank experiments demonstrated that oysters in an aquaculture-like setting altered the phytoplankton composition of the water and increased deposition of organic material on the bottom. This suggests that oyster aquaculture might help to clarify near-shore waters in places like Narragansett Bay that receive too many nutrients.
- Infrastructure was improved with the retrofit of the fish physiology laboratory at

URI's East Farm for use as a vaccine challenge facility. Holding tanks to treat effluent from tanks used in the lab were installed. With funds awarded from the USDA-CSREES, a Ziess LSM 5 Pascal Confocal Microscope was purchased.

- We evaluated the competitiveness of aquacultural versus traditional fishery products in the world market and analyzed implications of trade liberalization and subsidy reduction on both seafood trade and the use of fisheries.
- We investigated markets for bluefin tuna and shark fins, in both cases with a goal towards creating better management plans.

Outputs/Outcomes/Impacts

- Extension personnel met with several organizations representing commercial and recreational fishing interests in Rhode Island state waters to get them to identify their primary usage areas by marking nautical charts. These charts have been put into GIS format to assist aquaculturists in identifying open areas and/or potential user conflicts in siting new aquaculture facilities. This mapping effort is viewable at www.edc.uri.edu/fish, a part of the RI Environmental Data Center GIS database, and is also featured at www.narrbay.oreg, Rhode Island's "gateway web page for information on Narragansett Bay."
- Fish farmers can use information gathered on estrodiol immersion to change the phenotypic sex of summer flounder.
- Researchers served on the RI Coastal Resources Management Council's Working Group on Aquaculture Regulations, which consists of representatives from academia, government and stakeholder groups who provide advice to the RI-CRMC Aquaculture Coordinator. In addition, advice was provided to the RI Department of Environmental Management on disease issues and the inter- and intra-state transport of shellfish.
- Extension personnel contributed to teaching the annual Shellfish Aquaculture course for prospective aquaculturists in the state. RICE co-sponsored the 1st Annual Southern New England Aquaculture Conference (held coincidentally as the 5th Annual Rhode Island Aquaculture Conference) October 1-2, 2000 in Newport, RI, with over 140 participants. Extension personnel were involved in planning the 2nd Southern New England (6th RI) conference to be held in November 2001.
- A faculty member serves on the Senior Advisory Group to the Marine Stewardship Council, a worldwide seafood ecolabeling organization – the only viable entity currently in place. Results from URI research is regularly utilized to create ecolabeling policies, leading to the certification of 6 fisheries worldwide as sustainably managed.

Source of Funds—AES, CE, NRAC, Sea Grant.

Scope of impact—local, national and international.

GOAL 2: A SAFE AND SECURE

FOOD AND FIBER SYSTEM.

Overview. The Rhode Island Plan of Work includes its Program 3, Health and Well being of Fish and Animals, under Goal 2. We reasoned in the Plan that “animal husbandry practices that promote the health and well-being of animals and fish will often simultaneously create safer and higher quality food products...” We report here under the Key Theme, “Emerging Infectious Diseases,” which we found included under Goal 1 in the listing of Keywords and Themes.

We report limited progress on both programs 3 and 4. We have improved physical capacity to meet the goals of program 3 by constructing or improving facilities for fish and shellfish vaccine work and are now beginning these studies under a new AES project. We have encountered greater than anticipated delays in hiring food science faculty, which we see as vital toward bolstering the research component of our food safety program. We thus comment briefly on a limited number of milestones and anticipate greater progress in subsequent reports.

PROGRAM 3: HEALTH AND WELL BEING OF FISH AND ANIMALS

Overview: This program has made progress in the area of aquaculture-related diseases (see program 2, above), by developing preliminary results and facilities for fish vaccines against bacteria. We have approved a new Hatch project for three such studies (*i.e.*, 3 pathogens), RI00401 ‘Vaccine Development for Bacterial Pathogens: The Nutrient Approach.’

Animal health work has been slowed by shortages in faculty, forcing scientists to concentrate on classroom duties to the restriction of AES and CE activities. If this situation cannot be reversed in the next year, the animal health component of this program will have to be seriously reconsidered. In the interim, limited progress is reported, as follows:

Milestones

- Experiments using tick hemocytes as antigens for an anti-tick vaccine are ongoing. The anticipated response was observed in mice, but experiments on target deer are incomplete.
- Experiments on development of a vaccine for summer flounder against a bacterial pathogen are still ongoing.

Source of funds: AES

Scope of impact – Northeast region

PROGRAM 4: FOOD SAFETY

Overview: The future of the research component of the food safety program depends on academic hires in the Department of Nutrition and Food Science and the Department of Biochemistry, Microbiology, and Molecular Genetics. Current research in the food safety area lies with an NRI grant, RI00199902902, ‘Optical Biosensor Detection of Food

Pathogens Based on Direct Measurement of Antibody/Antigen Binding,' and is furthered by a recent equipment grant, RI009904804, 'Surface Scanning Biosensor for Microbial Pathogen Contamination in Fruits and Vegetables.' We continue to offer excellent and extensive outreach programs in food safety, with accomplishments as outlined here.

Key Theme – Food Safety and Foodborne Illness

Milestone:

- **Food Safety Education - Educators and School-aged Children:** The food safety curriculum, entitled "The Food Safety House – Preparing Food Safely" designed for grades 1-3 and 4-6 during the last fiscal year, continues to be distributed both in-state and out-of-state. This curriculum, a self-standing unit with highly visual graphics and colorful design, contains the entire curriculum for teachers. The curriculum is also accompanied by teacher's guide (1-3 or 4-6) containing optional activities and additional food safety information. However, all the curriculum information is contained in the "easel-like" curriculum and can be used by teachers without the guides if desired. The Food Safety house focuses on five areas or "floors" critical to understanding foodborne illness prevention – sanitation, food choices, food storage, food preparation and food reuse. It also contains a unit on the microworld and a concluding/review lesson. The curriculum was original designed through a financial partnership with Team Nutrition Institute at Kids First Inc. and distribution has been the responsibility of this agency.

Outputs/Outcomes/Impacts:

- The potential impact in the state of RI could be approximately 74,000 students in grades 1-6. Presentations have been delivered at professional meetings. The initial workshops (January/February, 2000) resulted in the distribution of 66 curricula to schools in Rhode Island. Since then, approximately 21 curricula have been distributed to schools, universities and professional associations throughout the country (NE, MN, CO, IL, ID, MI, WI, GA, DC, FL, CA, SD, WA) and even one to Geneva, Switzerland. The impact will be that schoolchildren are better educated about foodborne illness and can take that information home with them to the benefit of their families.

Source of funds: Smith-Lever, state match

Scope of impact: State specific and national

Milestone:

- **The 8th Annual Food Safety Conference** was held in conjunction and co-sponsorship with the Yankee Conference. This joint conference was sponsored by the Rhode Island Environmental Health Association, the New England Affiliates of the National Environmental Health Association and the RI Food Safety Task Force. The conference was held over September 26-28, 2001. The target audience was individuals who were responsible for developing and implementing food safety training for consumers, students or employees and regulators throughout the region. Speakers' topics included latex allergies, Food Code updates, developments in

biotechnology emerging environmental health concerns, innovative food safety education, liability and the food industry and health issues of multicultural audiences. Of particular interest was the session on bioterrorism. In addition to the workshop, a review session and exam for the Certified Food Safety Professional took place. The entire conference was rated highly.

Outputs/Outcomes/Impact:

- Approximately 160 regulators, school teachers, health service educators and dietitians, consultants and others were in attendance over the course conference. The session on bioterrorism was particularly well attended with an additional 40 participants registering for that presentation alone.

Source of funds: Smith Lever, state match, and external funding (participants, USDA competitive POW grant, FDA)

Scope of impact: Regional and State

Milestone:

- Continuing to work in collaboration with the RI Department of Education (RIDE), **Team Nutrition Institute at Kids First**, and the RI Department of Health (RIDOH) in the **School Food Safety Partnership**. This partnership was built on the on-going school food safety policy project from the RI food safety specialists and the programs in place at RIDE, Team Nutrition and RIDOH. CDC Funded the program entitled “RI Healthy Schools! Healthy Kids! School Food Safety Partnership” last year. Through this two-year initiative, this partnership was formalized and existing school food safety education programs, activities, curricula and assets were identified as well as gaps in food school food safety throughout Rhode Island. A long-term strategic plan was developed at the state-level for the development of a coordinated school food safety and serve as a model for other states. A survey, administered by the food safety specialists, at schools throughout RI was completed. The program will identify six schools to be part of the pilot school food safe program.

Outputs/Outcomes/Impacts:

- The grant funding is on-going, assessment of RI resources has been completed, and preparation for the pilot program has begun.

Source of funds: State match, Smith Lever and external funding (CDC).

Scope of impact: Initially, state specific. However, this partnership grant is only one part of a larger national initiative. Eventually, the work in RI will serve as a nationwide model.

Milestone:

- A **school food safety guidebook for extension educators** was completed and distributed to all participant food safety contact in the US Cooperative Extension System. The guidebook was written as a result of USDA funding to develop food safety policy at schools in Rhode Island through education. The booklet outlined the steps that should be taken to vitalize this program.

Outputs/Outcomes/Impacts:

- National distribution. In addition, this project was directly responsible for involvement in the School Food Safety Partnership described above. Presentations have been delivered.

Source of funds: State match, Smith Lever and external funding (USDA Comperitive Grant Program).

Scope of impact: State and National

Key Theme: Food Safety Education- Industry

Milestones:

- HACCP and sanitation education was offered to seafood and meat/poultry industry personnel to help them comply with FDA and USDA, respectively, food safety regulations. Knowledge of these regulations and how to effectively design HACCP and sanitation programs will help keep the participants in business. Seafood HACCP courses were offered in Connecticut and Rhode Island as well and SCP (Sanitation Control Procedures) courses. Finally, one issue of a “Seafood Savvy “ newsletter, jointly produced by the Universities of Connecticut and RI, was distributed to all those who participated in the CT and RI HACCP courses. The newsletter was developed to help keep people up-to-date on any changing r
- In addition, the seafood specialist was part of a USDA funded program to help adapt the existing seafood HACCP course to the internet. The course was officially available in mid-summer, 2001. Finally, the seafood/food safety specialist is available to the industry an informational resource whenever needed. The Seafood/Food Safety Specialist is a Board Member of the RI Seafood Council and acts as a resource on food-related issues. Finally, the specialist is also part of the National Seafood HACCP Alliance Steering Committee and therefore is involved with decision-making at a national level in regard to educational programming for the seafood industry.

Outputs/Outcomes/Impacts:

- The HACCP courses (one meat/poultry and two seafood) had 65 participants while one-day SCP workshop (two offered) had a total of 40 participants. The newsletter as produced one time during the reporting period and distributed to over 500 people that had participated in the CT and RI courses. All courses were evaluated and rated as very good to excellent

Source of funds: Smith-Lever and external funding (Sea Grant Extension)

Scope of impact: Multistate – *Connecticut*: Nancy Balsam, Diane Wright Hirsch, Cameron Faustman. Collaboration included organization of courses and teaching, and writing and production of newsletter. Also state and national impacts.

Milestone:

- Manager certification and re-certification were offered to the foodservice industry as

required by the state regulatory authority. The ServeSafe (National Restaurant Association) certification exam was administered. All certification and re-certification resource materials were revised and updated. This program is also offered in Spanish. In addition, the food safety specialist is available as an informational resource to the industry and family and consumer science teachers who offer the course to high school students in the state.

Outputs/Outcomes/Impacts:

- These courses must be offered to help educate foodservice personnel in safe principles of food handling and preparation and comply with the RI state regulations and, therefore, stay in business. The 15-hour certification course had approximately 100 participants and 75 students participated in the six-hour re-certification course offered through the URI College of Continuing Education's Office of Special Programs. These courses, 5 certification and 4 re-certification, were taught by the food safety specialist and other state approved instructors. The pass rate for the certification courses was 95%.
- There were two certification courses offered in Spanish impacting 40 participants. Finally, 25 students in high school family and consumer sciences programs took the certification course.

Source of funds: State match and Smith Lever, and external funding (Registration fees of participants - courses are self-supporting)

Scope of impact: State specific

Milestone:

- **Good Agricultural Practices (GAP) for to Integrate Food safety Principles Into Small Farm Production** was funded at the very end of the last fiscal year and has continued throughout the year. This New England regional project was an integrated outreach/research effort and the state food safety extension specialists have completed all of the first year objectives outlined in the timeline. Meetings and/or conference calls have been on-going with the state project directors as well as with state advisory group. The GAP guidelines were completed and agreed to by all the states. In addition, the GAP certification program audit has been completed, tested on-farm and revised accordingly. The regional grower survey has been completed as to GAP awareness and on-farm practices and data compiled. A regional consumer survey was also completed to ascertain consumer perceptions of fruit and vegetable safety and willingness to pay for produce from GAP certified farms. Pre-GAP microbiological testing has been completed in all states on strawberries, leafy greens, apples and/or tomatoes. Strategies for curriculum development were begun.

Outputs/Outcomes/Impacts:

- Results from this study will have the following impacts: 1) all small farmers of fruits

and vegetables in the region will learn more about Good Agricultural Practices and incorporate it into their techniques; 2) consumers will benefit because they will recognize and understand the meaning of their produce being grown on GAP-certified farms; and 3) the public as a whole will gain from decreased foodborne illness incidents associated with microbial pathogens now found on farms that do not practice GAP.

Source of funds: State match and Smith Lever, USDA Food Safety Funds (406 funds)

Scope of impact: State specific and multistate. The GAP grant has impact scope as multistate integrated research and extension for the six New England states participating: RI (lead state), CT, NH, MA, ME, and VT. All states are involved in a variety of educational programming and crop sampling for microbiological assessment pre- and post- GAP.

Key Theme: Food Safety Education – Consumers

Milestones:

- The extension seafood/food safety specialist is involved in a continuing consumer programming targeting seafood safety and quality issues. A free consumer lecture series was developed and offered once/month for June-September, 2001. The four lectures focused on the marine environment.

Outputs/Outcomes/Impacts:

- The consumer lecture series attracted over 120 people.

Source of funds: Smith-Lever and external funding (Sea Grant Extension).

Scope of impact: State specific

Milestone:

- Consumer food safety hotline continues to be supported by the food safety Specialist. Volunteers, recruited and trained from the Master Gardner Program, have been critical in the success of the hotline. In addition, food safety specialists are available as an informational resource whenever needed.

Outputs/Outcomes/Impacts:

- Approximately 1500 food safety-related calls from consumers have been answered
Increased consumer awareness as to food safety through print and voice media.

Source of funds: State match, Smith Lever.

Scope of impact: State specific

Milestone:

- The food safety education specialist has presented food education programs to senior groups. These workshops covered basic food safety principles of food handling, preparation and storage and how they would apply to home settings.

Outputs/Outcomes/Impacts:

- Presented twice to approximately 200 people. Well received by audiences.

Source of funds: State match

Scope of impact: State specific

Milestone:

- The volunteer or temporary foodservice worker-training curriculum was revised as part of a FDA Temporary Food Establishments Training Team. In addition to the RI food safety education specialist, this team was comprised of state food safety extension specialists, state regulators and FDA representatives. The goal was the training of state inspectors to inspect temporary food establishments that are manned by consumers i.e. community fairs.

Outputs/Outcomes/Impacts:

- Training program presented two times, Ontario, CA and Bismarck, ND to 75 state health regulatory officials. In addition, presentations were made at professional conferences.

Source of funds: State match, Smith Lever and external funding (FDA).

Scope of impact: National

Key Theme – Food Safety Education for All Target Audiences

Milestone

- A **URI Food Safety Website** was established and linked to the URI Cooperative Extension and RI Department of Health websites. The website contains fact sheets and ordering information of food safety education curriculum developed by the URI food safety specialists. This site provides food safety information useful to consumers, industry and educators.

Outputs/Outcomes/Impacts:

- No direct information of the number of website “hits.”

GOAL 3: A HEALTHY, WELL-NOURISHED POPULATION.

PROGRAM 5: NUTRITION

Overview: Faculty depth for nutrition programs remains relatively strong within the Department of Nutrition and Food Science. Here, the research agenda is largely following from outreach programming, complementing regional research programs on eating habits of both young and elderly adults, in both cases emphasizing behaviors determining consumption of fruits and vegetables, and on attending health benefits. Two multi-state projects NE-172, ‘Nutritional Risk and Antioxidant Status in the Elderly,’ and NC-219 ‘Using Stages of Change Model to Promote Consumption of Grains, Vegetables and Fruits

by Young Adults,' provide the basis for much of the outreach program. In addition to ongoing programs under EFNEP, the following reflects progress in implementing research results (from two multistate research projects) through outreach.

Key Theme—Human Nutrition

Overview: The goal of CE nutrition is to help individuals of all ages increase the quality and years of healthy life by improving diet quality. The outreach program provides science-based information to help individuals gain the knowledge, motivation and opportunity they need to make informed decisions about food and nutrition. In addition, the program is designed to encourage local and state leaders to develop community and statewide efforts that promote healthy behaviors and create healthy environments.

Milestones:

- A technique to estimate carotenoid intake was evaluated on 200 elderly Rhode Islanders as part of a study of fruit and vegetables as sources of antioxidants.

Outputs/Outcomes/Impacts:

- Community-based presentations were presented to support programs for elders with visual impairments. The program was provided at 10 sites, reaching 108 visually-impaired people, all of whom indicated a willingness to change behavior to increase intake of protective foods in their diets.
- Interventions to increase fruit and vegetable consumption in young adults should be tailored to motivational readiness to change for fruit and vegetables separately.
- The Expanded Food and Nutrition Program (EFNEP) reached 867 individual clients, and 2,657 youth reached through intensive small group workshops and individual counseling within EFNEP for a 4-6 month period.
- RI Public Transportation Nutrition Education program put 220 posters in bus interiors, 60 on exterior taillight bus posters, and were rotated six times per year through 6 different AdPanels in approximately 50 bus shelters.
- The cumulative impact of these programs has not been explicitly measured, however, it should be presumed that at least a portion of the stakeholders involved developed better nutrition habits.

Source of funds: AES, CE, USDA

Scope of impact: state

GOAL 4: GREATER HARMONY BETWEEN AGRICULTURE AND THE ENVIRONMENT

PROGRAM 6: NATURAL RESOURCES AND THE ENVIRONMENT

Overview: There is considerable overlap between Goal 1 and Goal 4 in Rhode Island's research and outreach projects due to the heavy emphasis on low-input (including low-pesticide) agriculture, especially on the role of biological control for pest management of insects, ticks, and invasive plants. Second only to the Narragansett Bay, Rhode Island's greatest natural resource is its abundance of high quality ground water. Our programs and projects share a common concern of protecting this resource from pollution and overuse.

Nowhere else in our portfolio is the relation between research, outreach, and academics so

tightly integrated as in this Program. In part, this is because the core projects are all well supported by mature staff, most of them veteran research associates with 10-15 or more years experience. Also, it is in this program area that we have the greatest degree of faculty commitment to integration between research and outreach: Here, the commitment is fully two-way. That is, not only are the researchers dedicated to seeing that their results are incorporated into active outreach projects, but also the extension staff are dedicated to basing their programs on the latest science and technology.

Key Theme–Water Quality

Overview: URI Cooperative Extension’s community-based natural resources and the environment education program targets municipal officials, local organizations, professionals, and individuals. Our goal has been to educate audiences to recognize, assess, and effectively minimize pollution risks to local water resources and to protect critical habitats within the State. Our approach implements the capabilities of the University of Rhode Island (URI) Cooperative Extension (CE) Natural Resources and the Environment Program, an integrated outreach program that educates, empowers and involves Rhode Islanders to become effective stewards of the State’s natural resources.

Multiplied impacts of Research–Teaching–Extension linkage:

The URI CE Water Quality Program is founded on a robust exchange with URI research programs that provides CE with new insights for nonpoint education management and provides Rhode Island Agricultural Experiment Station researchers with new research challenges. Examples of URI research efforts directed to our CE program include: research that centered on understanding fate of agrichemicals in home landscapes; pollution abatement technologies for on-site wastewater systems; analyses of spatial databases and GIS for watershed management; and recent research on the role of riparian areas for pollution control.

Performance Goals:

- Develop and deliver education programs to increase public knowledge of their local environments to improve community-based management of local water resources and critical habitats.
- Develop and deliver educational programs that increase the knowledge of municipalities, community groups, and the public on site-specific best management practices needed to address locally-identified resource protection issues.
- Maintain and strengthen effective partnerships with federal, state, local, public, and private organizations for more effective and sustained solutions to long-term watershed and critical habitat issues through community-based education.

The research agenda is driven by several faculty who are prodigious in securing competitive grants. In conjunction, the faculty have various USDA-funded projects, including: Hatch project RI00321 ‘Control of Nitrate in Watersheds Affected by Unsewered Residential Development,’ NRI grants RI0019991119 ‘Subsurface Riparian N Removal: The Role of Landscape Setting,’ and RI9803850 ‘Increasing Root Zone Depth and Seasonal Efficacy for Constructed Wetland Filters,’ a Fund for Rural America grant, RI-9704767 ‘New Tools to Guide Land Use Change in Rural Watersheds,’ and a “406” grant RI0-2000-05493 ‘New England Regional Water Quality Program.’

Milestone:

Coordinate the New England Extension Water Quality Program. The six New England Land Grant Universities have received a four year grant from the USDA/CSREES "406" Water Quality Program to improve water quality management through the coordination and sharing of educational knowledge and extension programming that emerges from a research base. The 406 program is part of a national network based on regional land grant university partnerships in each of the 10 EPA regions. Our Program will build on the strengths and partnerships of the six New England Land Grant University Water Quality Programs. The Program will center on the following focus areas:

- ◆ Volunteer water quality monitoring (ecosystem scale)
- ◆ Community-based watershed protection (community and watershed scale)
- ◆ Agricultural best management practices (field and farmstead scale)
- ◆ Residential pollution prevention (household scale).

Outputs/Outcomes/Impacts:

- Monthly conference calls of steering committee.
- On May 21, 2001 The New England Region Water Quality Program Steering Committee met with EPA Region 1 representatives in Boston, MA. (See appendix for agenda.) As a result of the meeting: Each state water quality program and appropriate staff were to meet with state EPA contacts; and, each focus area team were to meet with appropriate EPA program staff. The purposes of these meetings were to alter EPA to our emerging opportunities and to strengthen existing partnerships and establish new ones.
- Annual conference, December 11-12, 2001 in Narragansett, RI.
- Development of Regional Program webpage. Work with other funded regions to provide webpage templates. Develop prototype of National Water Quality Program webpage.
- The New England Water Quality web page has been launched and is serving as a model for the other funded regions and for the national program web page. The model was presented at the National Water Quality Coordinators' meeting in San Antonio Texas in March 2001. The page is located at www.usawaterquality.org. The regional website represents the overall New England Program as well as the New England Focus Areas. This page serves as our thematic-based programs to Federal, State and local agencies and organizations.
- In May 2001, the Project Steering Committee met with EPA Region 1 representatives in Boston to begin coordination with EPA New England. Regional coordination is underway with EPA to address private drinking water well protection.

Source of funds: CSREES, state

Scope of impact: regional

URI On-Site Wastewater Training Center:

As the only onsite wastewater training center in the New England regional and the nation's second established facility the URI Center provides onsite wastewater outreach education to local, state, regional and national audiences to include the following:

Develop new and enhance existing training curricula geared to professional practitioner audiences dealing with a full array of onsite wastewater tasks. Provide research based technical assistance, outreach and continuing education classes to local, state, regional, and national private sector onsite wastewater practitioners and regulatory officials concerning the siting, design, installation, inspection, operation, and maintenance of alternative and innovative onsite wastewater systems.

Design, install, maintain and evaluate the performance of alternative and innovative septic systems as part of a state-wide demonstration system network.

Educate municipal officials about onsite wastewater treatment systems in cooperation with the URI Cooperative Extension Nonpoint Education for Municipal Officials Program staff. Educate homeowners about septic system function, and operation and maintenance. This activity done in conjunction with A. McCann, H. Burdett and the Rhode Island Home*A*Syst Program.

Milestone:

- The URI CE On-Site Wastewater Training Center (OWT) was established in 1994. It is now recognized as the premier demonstration and field training center for alternative septic system technologies in the Northeast, one of eight regional centers nationally. The goal of the program is to provide training and technology transfer on septic system design, operation, and maintenance to protect and restore local water quality.

Outputs/Outcomes/Impacts:

- The OWT operates in partnership with state and federal agencies, municipalities, and over 40 private sector contractors. The field-training center, located on the URI Kingston campus, consists of nineteen innovative and alternative full-scale systems constructed above ground for hands-on learning. Each of the demonstration septic systems are based upon proven technologies that minimize nutrient and/or microbial loading to ground and surface waters. The OWT is a major resource for RI and for Extension programs throughout New England.
- Held the following workshops for municipal officials: Hands on Septic System Basics, URI Onsite Wastewater Training Center field tour for town officials and interested citizens, October 2000; Field Tour of Onsite Wastewater Treatment Options, April 26, 2001; Alternative Systems Workshop, Vermont Onsite Wastewater Technical Advisory Committee. Special workshop for Vermont legislators, regulators, and government officials from Vermont and RI, June 26, 2001.

Source of Funds: All of programs exist through a combination of formula funds and external funds. Proposals are regularly submitted to competitive grant programs through CSREES, EPA, the State of Rhode Island, and others.

Scope of Impact: State, regional

URI Watershed Watch:

Watershed Watch is a scientist-led volunteer water quality monitoring and education program. The goal of Watershed Watch is to promote active citizen participation in water quality protection, educate the public about water quality issues, obtain multi-year surface water quality information both to determine current conditions and to detect trends. Watershed Watch encourages community-level and personal stewardship of local watersheds and serves as the steppingstone for increased community involvement by the volunteers themselves.

Milestone:

- Educate and provide scientific support to volunteer water quality monitors to increase local knowledge and stewardship of community water resources.

Outputs/Outcomes/Impacts:

- The URI Watershed Watch Program works with more than thirty local sponsors which include municipal conservation commissions, watershed associations, lake and pond associations, conservation organizations, sporting groups, the Rhode Island Department of Environmental Management, and US EPA's New England regional office.
- The URI Watershed Watch Program has over 250 volunteers, or citizen scientists, who spent over 2000 hours monitoring 165 sites throughout the state. There were 90 lakes and ponds sites, 37 river sites, 28 tributary streams sites, 11 salt pond sites, and 11 saltwater sites. These were located in 13 out of 14 major Rhode Island watershed.
- Five types of volunteer training programs were held.
 - The standard URI Watershed Watch volunteer lake and pond training consisting of a classroom and field training components (2 sets of training sessions were offered but each volunteer required to attend only one of each – total time approximately 6 hours per volunteer).
 - Stream monitor training consisting of 1 classroom and 1 field training session, (total time approximately 6 hours per volunteer).
 - Salt Pond Watchers estuary monitoring training consisting of classroom and 1 field session (total time approximately 6 hours per volunteer).
 - Salt water bacterial monitoring training for members of the RI Chapter of Surfrider Foundation (approximately 2 hours per volunteer).
 - Training was also provided to URI Watershed Watch and Wood-Pawcatuck Watershed Association Coastal Fellows on stream hydrology, flow and habitat assessment (approximately 4 hours each).
- Monitoring activities
 - URI Watershed Watch volunteer monitors mailed in over 1600 postcards containing their field monitoring results of water clarity, temperature, dissolved oxygen content, salinity, and weather conditions.
 - These volunteers collected and processed 3500 water samples for subsequent laboratory analysis of chlorophyll, an important indicator of algal concentration.
 - They collected 625 sets of water samples during the 2001 season, which were analyzed in the URI Watershed Watch Analytical laboratory for pH, alkalinity, total and dissolved phosphorus, total, nitrate, and ammonium nitrogen, chlorides, fecal coliform and *e. coli*.

- URI Watershed Watch provides summaries of monitored data:
 - 2000 data provided as Excel files to RI DEM in spring of 2001, and upon request to local organizations.
- During 2000 – 2001, URI Watershed Watch worked closely with a number of organizations to address water quality concerns identified through volunteer monitoring efforts. These include:
 - RI DEM development of a list of impaired waters for the State (303 (d) list).
 - Stafford Pond Technical Advisory Board to help facilitate implementation of best management practices, and a public watershed education strategy.
 - Narrow River Preservation Association, RI DEM and CRMC in the development of a special area management plan and total daily maximum loads assessments.
 - Portsmouth Conservation Commission addressing aquatic vegetation and nutrient loading concerns in Upper Melville Pond.
 - Trout Unlimited Narragansett Chapter in an effort to acquire protection of native brook trout habitat.
 - Narragansett Indian Tribe efforts to protect water quality throughout their tribal lands.
 - Audubon Society of Rhode Island efforts to protect the Queen River watershed
 - Other communities and organizations as requested.

Source of Funds: All of our programs exist through a combination of formula funds and external funds. We submit proposals to competitive grant programs through CSREES, EPA, the State of Rhode Island, and others.

Scope of impact: State

RI Home*A*Syst Residential Pollution Prevention Program:

RI Home*A*Syst is a residential pollution prevention education program that provides an action-oriented approach to protect water quality. The program is a voluntary residential pollution prevention program that trains residents to protect their health and environment. Home*A*Syst, or Home Assessment System, offers a procedure to assess environmental risks around the home and take actions to correct any identified problems.

Milestone:

- Educate citizens to identify environmental risks in and around the home and to take personal actions to protect or restore water quality in the home environment through URI Home*A*Syst.

Outputs/Outcomes/Impacts:

- The University Rhode Island Home*A*Syst Program works closely with URI's On-Site Wastewater Training Center to conduct community workshops on private well protection and septic system operation and maintenance in partnership with local community organizations and municipalities. Protecting Water Quality and Septic System Operation and Maintenance Workshops – The URI Home*A*Syst Program. These workshops address private well water protection and septic system operation and maintenance. We typically offer these programs in partnership with local

organizations and municipalities throughout the state.

- ◆ West Greenwich Conservation Commission. September 25, 2000. Protecting Your Drinking Water Well and Septic System Operation and Maintenance.
- ◆ Salt Pond Coalition Annual Summer Lecture Series. Invited speaker on drinking water well protection. June 12, 2001 at the Crossmills Public Library.
- ◆ Septic System Operation and Maintenance Programs and Field Tours in cooperation with URI's On-Site Wastewater Training Center. October 3, 5, 2000. May 14, 21, June 7, 19, July 30, August 9, 2001
- ◆ Gloucester Series of Workshops on Septic System Operation and Maintenance. October 11, November 18, 2001.
- ◆ Block Island / Greenhill Pond National Decentralized Wastewater Management Project. Press Conference with area newspaper editors, May 18, 2001 at the Charlestown Town Hall.
- ◆ Warwick / Greenwich Bay Special Project. In partnership with Southern RI Conservation District and the Oakland Beach Association. March – May, 2001. 5 session program
- ◆ URI Master Gardener Annual Training. Protecting Drinking Water Resources. February 7, 2001.

Milestone:

Extension worked closely with RI HEALTH to develop the RI Source Water Assessment Plan. This included:

- Serving as an active member of the technical committee developing the plan
- Developing methodology to identify and rate pollution threats, and to rank the status of source water watersheds and wellheads
- Providing technical support to RI HEALTH in applying the methodology in small community supplies, development of a methodology to incorporate active participation by both Home*A*Syst volunteers and community leaders in the assessment process, and URI support in conducting the assessments in the State's major water supplies

Because most source water protection areas are privately owned and subject to local land use plans and development regulations, local management is considered the most, if not the only effective long-term protection strategy.

Outputs/Outcomes/Impacts:

- With Extension support the RI has adopted a unique community-based approach to source water assessments that involves citizen volunteers and local community leaders in all phases of the assessment.
- This approach relies on local partners to direct the assessment with State and EPA support, leading to selection of local management.

Citizen volunteers and community leaders are participating in assessment projects conducted in the following communities during this reporting period:

- South Kingstown and Charlestown. January – April, 2001
- North Kingstown, Jamestown, and Kent County Water. March – May, 2001
- Tiverton and Little Compton. June – December, 2001
- Bristol County Water. December, 2001 – April, 2002

Milestone:

Coordinated with Extension's EFNEP Program and Indoor Air Quality to develop a target training for Program Aides with the USDA Healthy Homes materials. Program aides are distributing Healthy Homes handbooks to their clientele. The handbook contains chapters on Indoor Air Quality, Lead, Drinking Water, Hazardous Household Products, and Pesticides. The handbook targets protecting children's health and is available in English and Spanish.

Outputs/Outcomes/Impacts:

- URI Home*A*Syst Training Program with EFNEP Program Aides. Scoping meeting with aides, May, 2001. Training, August 29, 2001 URI's Coastal Institute, Bay Campus.
- The Rhode Island Department of Health is using the handbook in training with the RI Visiting Nurse's Association and the Association is distributing it.

Milestone:

In cooperation with the Southern New England Forest Consortium, began development of a woodscaping educational supplement to the URI Home*A*Syst Program. Project consists of printed information, educational display, and training workshops.

Outputs/Outcomes/Impacts:

- Developed and met with Project Steering Committee, April, 2001.
- Held Focus Group meeting with target audience, October 29, 2001, to determine written material comments.

Milestone:

URI Home*A*Syst participates in the RI Envirothon Program, an environmental program for high school students that trains them in a variety of environmental topics, including water resource management and project. The project culminates in a statewide competition and the winning team goes on to participate in a national competition.

Outputs/Outcomes/Impacts:

- Annual training program for students and their teachers. January 2001.
- Statewide competition. May 2001.

Displays, Web page updates, and new educational materials developed.

Web page updates:

The RI Home*A*Syst web page has been updated to include program information on: septic care for renters and vacationers to Rhode Island, septic system factsheet series, and water conservation.

Written educational materials

Developed and printed 9 factsheet series and folder entitled: Septic System Information for Rhode Islanders. Package is distributed at programs and is available on the web.

Source of funds: CE, State, grants

Scope of impact: Statewide

Municipal Watershed Management Training:

URI Municipal Watershed Training Program is a NEMO-based (Nonpoint Education for Municipal Officials) program using GIS-based watershed assessment tools. It provides local decision-makers with the knowledge and educational resources to identify local water quality problems and to adopt effective pollution controls within a watershed context.

Milestone:

- Through the Municipal Watershed Training Program, Cooperative Extension offers three levels of outreach to local officials on local control of nonpoint source pollution:

Outcome/Output/Impacts:

- URI's Watershed Watch Program has over 200 volunteers, who spent over 625 hours monitoring 153 sites throughout the state.
- Five types of volunteer training programs were held:
 - The standard URI Watershed Watch volunteer training consisting of a classroom and field training components (2 sets of training sessions were offered but each volunteer required to attend only one of each – total time approximately 6 hours per volunteer).
 - Pawcatuck stream training consisting of 2 classroom and two field training sessions, including stream flow measurement and habitat assessment (total time approximately 10 hours per volunteer).
 - Salt Pond Watchers training consisting of 1 field session on dissolved oxygen, water clarity and salinity monitoring (total time approximately 3 hours per volunteer).
 - Stream macroinvertebrate assessment training offered through the New England Regional Monitoring Collaborative of which URI Watershed Watch is a founding member. All day session included half-day in a classroom and half-day in the field (total of approximately 7 hours per volunteer).
- Source Water Assessments of Major Water Supplies: Conducted GIS-based pollution risk assessment in partnership with municipal officials and RI Department of Health. Included GIS database development, pollution risk analysis using the MANAGE model, coordination with local advisory groups, and presentation of results. Multi-session programs organized and delivered in the following areas: Aquidneck Island; Cumberland, Lincoln and Pawtucket; South Kingstown and Charlestown; North Kingstown, Exeter Kent County; Jamestown.
- Community Wastewater Needs Assessment: Conducted GIS-based pollution risk assessment and provided related technical support for development of local wastewater management ordinances in the following communities: Chepachet, Gloucester, Jamestown, New Shoreham, South Kingstown, and Charlestown.
- Block Island/Green Hill Pond Watershed National Wastewater Treatment Demonstration Project: Support in developing town annual workplans, Block Island monitoring strategies, South Kingstown public outreach plans, and SAFEWATER logo with fact sheet templates.
- Survey of Municipal Training Needs: Surveyed RI Council, Board and Commission members of 39 RI cities and towns, and analyzed the data for GrowSmart Rhode Island.

Source of funds: CE, state, towns

Scope of impact: state

Critical Habitats Program:

The Critical Habitats Program provides training, database development and internet access for local-decision makers and the public to use spatial data technologies in protecting lands critical for sustaining the health and environmental quality of Rhode Island. The program is the primary source of web-based Geographic Information System (GIS) data and hands-on training within the State and offers semi-annual courses in ArcView (a desktop computerized mapping and information system) to local and state decision makers. The Critical Habitats Program coordinates closely with the RI Natural History Survey to enhance the extent of locally relevant data available to environmental resource managers and the public. The program also collects and distributes high-accuracy Global Positioning Systems (GPS) base station data and conducts training in GPS field data collection for natural resource management.

Milestone:

Educate local decision makers and resource managers in the use of Geographic Information System (GIS) to:

- Identify areas of critical resource protection in communities for the purpose of conservation and management.
- Incorporate use of multiple spatial databases for water resource impact assessment and protection.
- Identify high risk pollution areas.
- Analyze cumulative impacts of land use decisions to water quality.

Outputs/Outcomes/Impacts:

- Introduction to ArcView is offered four times each year. This 24-hour short course provides training to approximately 100 people per year in the use of ArcView and accessing the Rhode Island GIS database for environmental management and protection.
- Providing 24/7 access to geospatial data (GIS <http://www.edc.uri.edu/rigis> , orthophotography - <http://ortho.edc.uri.edu> , GPS base data <http://www.edc.uri.edu/gps> , static <http://www.edc.uri.edu/riatlas> and interactive digital maps <http://www.edc.uri.edu/eelgrass>) via the world wide web.
- Upgraded GPS base station from mapping to survey grade. The result is improved spatial data accuracy, two new file formats available through an enhanced web interface, and participation in the National Geodetic Survey's Cooperative CORS program <http://www.ngs.noaa.gov/CORS/Coop/> Funds for equipment upgrade leveraged through URI Transportation Center and U.S. Department of Transportation.
- Worked in cooperation with the RI Geographer's Alliance to develop and deliver new training component targeted towards Rhode Island school teachers. Project

one, two, tree is a year-long pilot educational program working with teachers from 8 Rhode Island middle and high schools. The project trains teachers in using GIS software and incorporating it into their classroom by participating in a community tree inventory project. Students present their work to their town councils and other community members at the close of the project.

- URI was selected to participate in special pilot project with Orton Family Foundation's Community Viz software, a visualization software that runs inside ArcView to help communities weigh the impact of various decision making options. Project consists of pilot study site, training, and feasibility to determine use of software for target audiences.
- Presentations at Annual Northeast ARC Users Group meeting, November 2001.
 1. Use of Community Viz Software at URI.
 2. Panel member for presentation on: GIS Training Programs for Professionals.

Source of funding: grants, CE

Scope of impact: regional

Key Themes—Wetlands Restoration and Protection, Forest Resource Management:

The Station has particular strength in its wildlife faculty, who are united in their focus on understanding the role of forest wetlands in the ecology of local and migratory wildlife. Vernal pools in particular are an object of interest to hydrologists, entomologists, herpetologists, and ornithologists. We are thus interested in developing predictors (hydrologic and geologic) of groundwater abundance, links to periodicity of temporary pools, and the corresponding distribution and abundance of insects, amphibians, and birds in the forest habitat. USDA projects include Hatch projects RI 00318 'Land Cover Change in Rhode Island from 1972 to 2002 and the Impact on Forest Ecosystems,' RI00969 'Forest Area, Habitat, and the Distribution of the Northern Waterthrush and Canada Warbler in RI,' RI00319 ;Habitat Characteristics of Pond Breeding Amphibians in Rhode Island,' RI00315 'Subaqueous Soils and Shallow-Subtidal Wetlands in Rhode Island,' and RI00316 'Land Management and the Population Dynamics of Ecology, and Physiology of Migratory Songbirds in Coastal Southern New England,' and McIntyre-Stennis project RI00MS970 'Predictors of Hydroperiod in Southern Rhode Island Vernal Pools.'

Milestones:

- We undertook a major study to quantify population sizes, seasonal movement and calling phenology, and reproductive rates for pond-breeding amphibians in southern New England.
- We evaluated the impact of forest fragmentation and suburbanization on frogs and salamanders.
- Research results show that even very small (<1 ha) swamps may provide significant habitat, as long as the surrounding upland is heavily forested, with a minimum of paved roads.

Outputs/Outcomes/Impacts:

- We are exploring the value of our amphibian research work with developers (golf courses), non-government conservation agencies, and state conservation agencies concerned with threatened species.
- We demonstrated that swamp size was the most important landscape variable in determining species richness of the bird community. For forest-interior birds, we showed that overall landscape composition (i.e., the amount of forest available to the birds) may be more important than swamp size for the most common species (Veery, Northern Waterthrush, Black-and-white Warbler, and Canada Warbler).

Key Theme–Natural Resources Management

We are bringing on line a new physical facility dedicated to public policy decision making using economic simulations and visual and virtual reality tools. This facility is part of a Coastal Institute Building that opened at the end of 2000, collectively referred to as the Economic Policy Simulation Laboratory. Here we will extend our traditional strengths and interests in valuation methodology and public policy, allowing us to take studies such as those outlined in what follows to a new level of scholarship and impact.

The USDA-funded research program includes Hatch project RI00198 ‘Managing Coastal Marine Ecosystems: Socioeconomics, Environmental Science and Policy,’ and Fund for Rural America project RI-9704783 ‘Decision Information and Support Structures to Sustain Farm, Forest and Open Space in Rural Communities in Southern New England.’

Milestones:

- Researchers developed and applied economic valuation methods to address coastal resource management issues in the Northeast region. A wide range of valuation methods was applied to a variety of coastal issues.
- The Orton Foundation awarded the University software that the Foundation developed, called Community Viz, which is based on GIS data and allows for 3D visualization of development.
- The Policy Simulation Laboratory is now fully equipped and operational after significant Station investment in computers and programming support. The SimLab is a state-of-the-art facility for carrying out decision research that ranges from basic research on decision making to highly applied work to help communities make wise policy choices on resource management.

Source of Funds–AES and external grants.

Scope of Impact–Northeast region.

GOAL 5: ENHANCED ECONOMIC OPPORTUNITY AND QUALITY OF LIFE FOR AMERICANS

PROGRAM 7: SUSTAINABLE AND NURTURING COMMUNITIES

Overview: Since setting out our Plan for Program 7, we have been exploring the desirability

of dividing this Program into two components, “Sustainable Communities” and “Children, Youth, and Families.” We have not completed such a dichotomy (which we would document via a revised Plan of Work), but are progressing toward greater cohesiveness within the two components.

Extension was key to completing eight years of effort in Rhode Island to establish a Rural Development Council (“the Council”). We entered into an understanding with the RI Economic Development Corporation, which was overseeing State efforts to establish the Council, and completed final agreements and required paperwork to obtain State fiscal support, Governor’s approval and appointments to the Council, and to complete required federal paperwork. The approval of the Council, which implies release of federal and state funds sufficient to hire a director and partial staff, creates a new focal point for community outreach activities related to growth management, environmental and economic planning, housing, and water quality. We have assigned to a program leader responsibility to develop a more focused plan for these activities, and this exercise is continuing.

We have also made changes in linking Extension youth programs to a proper academic and research base in our College of Human Science and Services, Department of Human Development and Family Studies. A key milestone was to enlist the new chair of the Department as a Program Leader to concentrate on Children, Youth, and Families.

Children, Youth, and Families Programming: In Rhode Island, the child poverty rate is increasing in many communities. Despite a period of economic prosperity, credit card debt is increasing, savings are inadequate, and many individuals and families are facing defaults on mortgages and credit cards. Violence is an issue of grave concern, with children and youth being both victims and perpetrators. The majority of working parents with infants and school age children express concern about the lack of affordable, quality childcare, and the growing unmet need for before- and after-school care. The increasing stressors of poverty, coupled with growing workplace demands, rising costs of housing, and the lack of an adequate network of accessible youth and family services place many Rhode Island families at risk. The Rhode Island AES and CE have identified the following issues to address Goal 5 within the program area of Children, Youth, and Families.

Family or community approaches to ameliorate poverty-induced stress in youth and methods to improve access to social programs for youth and families, including development of parental skills to teach children limits and how to avoid violence. Methods to improve youth and adult financial literacy and studies of public policies and private practices to enhance family-run small businesses.

URI’s Cooperative Extension activities addressed these issues by identifying communities at special risk, assessing community needs, and delivering programs to meet those needs. Programs that are highlighted in this report focus on staff development and training in child care and youth development; parent and family life education; youth leadership and development; and improving the financial literacy of working adults. The quality and scope of the programming is especially noteworthy given the very limited staff devoted to these efforts.

Sustainable Communities Programs: As we work on improving our plan for sustainable communities, we are working in parallel with University efforts to define additional programs under the same label. For example, the University Honor’s Colloquium for the academic year 2001-2002 has the theme “Sustainable Communities!” There is also an

on-going faculty and administrative group defining an Initiative, the University's label for a focused collection of research and curricular developments that reflect one of the University's areas of current or future strengths.

Key Theme—Community Development

The outreach component of community development is supported by research done in the following USDA-funded projects: multi-state project NE-162 'Rural Economic Development: Alternatives in the New Competitive Environment,' Hatch projects RI00103 'A Policy Simulation System for Economic Science and Policy Analysis,' RI00199 'Decision Support Tools to Manage Coastal Development,' and RI00101 'Forecasting the Spatial Dispersion of Rhode Island Population and Employment,' and NRI project RI-9803803 'Economic Development Policy Making in Non-Metropolitan Countries Adjacent to Metropolitan Areas.'

Milestone:

- A database of socio-demographic and environmental indicators and employment levels in major industry categories for each town in Rhode Island, Connecticut and Massachusetts has been created for 1990 and 2000.
- Assessed the relationship of experts to public policy, applied to case studies involving economic development policy in rural counties adjacent to metropolitan areas. Factors that appeared most frequently to be related to increased knowledge transfer between experts and policy maker were: goal consistency, entrepreneur/facilitator roles, strong private sector participation and high levels of support for the project.
- Identified characteristics of growth management packages that maximize public support and provide effective incentives for land preservation, growth management, and maintenance of productive farms and forests; and land parcels that maintain ecologically unique and valued biodiversity attributes within rural communities.
- Through land-use modeling based on environmental factors and socio-economic models using historical population and employment data, research findings suggest that containment of sprawl will be increasingly difficult unless new techniques are found to encourage higher-density development in established villages.
- Community-based workshops were held in several rural communities to examine alternative management schemes for watershed protection. A GIS based decision support model was refined and tested at the community level to help rural community decision makers identify and protect farmland and open space that would pose high environmental risk if residential development replaced current land use.

Outputs/Outcomes/Impacts:

- Develops the basis for further study of policy-making in rapidly growing rural counties adjacent to metropolitan areas. The results point to ways that federal agencies, especially EDA and USDA Cooperative Extension can improve the outcomes of public policy relevant to economic development.

- Furnishes the State and local communities with information about the patterns of employment and household growth around the region over the past decade.

Source of Funds: Federal and State

Scope of Impact: regional

Key Theme—Youth Development/4H

Milestones:

- Seventy RI 4-H Youth Development Programs emphasize experiential learning in research-based curricular units focusing on science and technology, animal and veterinary science, fishing and aquaculture, foods, nutrition, and health, environment education, communications and creative arts, leadership development, and community service. Over 280 RI volunteers donated 52,000 hours to youth programming.
- The 4-H Conservation Day involved 170 children in a day of hands-on learning activities and demonstrations about fish and plant life and the forests, grasslands, and water ecologies of Rhode Island. Co-sponsored by the U.S. Fish and Wildlife Service, the Aquatic Resources Education Program of the Division of Fish and Wildlife; the Rhode Island Department of Environmental Management, and the RI Cooperative Extension Service. Other participating agencies included Environmental Sciences Services, Inc.; U.S. EPA in Narragansett, RI; the Audubon Society of Rhode Island, and the Rhode Island Wild Plant Society.
- In the 4-H horse program, 193 youth gained skills and knowledge about horses, and social and leadership skills through 4-H club activities, quiz bowl, hippology, general knowledge tests, and putting together public presentations, exhibits, and learning stations. This learning and skill development took place at 4-H meetings, workshops, district and state contests, the 4-H animal Careers and Livestock Field Day, State 4-H Horse Show, the New England 4-H Horse Activity, and the Eastern National 4-H Horse Roundup.
- Through a new grant from the Rhode Island State Council on the Arts and funding from the Rhode Island 4-H Club Foundation, the Rhode Island 4-H Creative Arts Series was established. This program involves workshops, presentations and demonstrations by professional artists, and opportunities to explore careers in the arts. Two workshops were offered in each district.

Outputs/Outcomes/Impacts:

- Youth Development programs reached 1100 youth in 98 neighborhood, community, school and agency-based 4-H clubs in rural, suburban, and urban communities. 300 adult and teen volunteers worked with 4-H groups. 4-H members demonstrated or reported increases in skill and knowledge in leadership, communications, and skill mastery.

Source of funds: RI 4-H Club Foundation, state funds, formula funds.

Scope of impact: Primarily State specific – Rhode Island. Multistate involvement with Universities of Maine, New Hampshire, Massachusetts, Vermont, and Connecticut; National

4-H Council, National 4-H Congress.

Key Theme—Children, Youth, and Families at Risk

Milestones:

- Cooperative Extension educators subcontracted to the University of Rhode Island's Urban Field Center to identify the Rhode Island cities and towns considered to be at high risk for declining social and economic conditions. Once identified, the Cooperative Extension educators then developed a programmatic needs assessment to identify subject matter and training needs in the areas of children, youth, and family life.
- The program FACE IT (Families and Communities Engaged in Issues Together) was developed and delivered in five Rhode Island communities. The project is a collaborative effort between University of Rhode Island, community agencies, and community volunteers. It involves professional staff development and training for those working in child care and in-school and after-school settings; parenting education classes and parent-to-parent support groups; and community asset building through formation of community advisory boards, an interactive web site, and opportunities for participants to earn college credit through the Office of Special Programs at the URI Providence campus.
- Through a FACE-IT grant, 4 community advisory boards were established in at-risk communities. The community boards, which include professionals, parents and teens, focus on assessing community strengths and needs, and identifying resources to meet those needs.

Outputs/Outcomes/Impacts:

- Staff in the CYF program have provided training to community professionals working with pregnant and parenting teens. They have developed curricular materials and offered workplace education focusing on basic parenting education, independent living skills, and strategies for strengthening parent-child communication. These workshops and training sessions, staff reach 600 adults annually, and, as a result, have an impact on over 3,000 children statewide.
- Since 1996, over 53,000 volunteer hours have been contributed to the activities of the project. In post-workshop evaluations, 90% of participants indicated that the information was practical, 72% reported that they learned at least three new concepts of practices for working with their respective clients, and 92% rated the workshops as excellent.
- Through the Electronic Connectivity component of this grant, parents, teens and professionals in under-resourced communities have developed skills at finding information about resources on the Internet and communicating electronically with board members in other communities. Computer literacy and access to the Internet have been important new resources for youth and families in these communities.
- In FY 2002, over 600 teens and adult staff have been trained; over 500 parents attended parenting education classes; and four community advisory boards were formed which have carried out their own needs assessments to address community-based needs.
- URI undergraduate interns have worked as mentors at community sites each semester.

Source of funding: CSREES CYFAR, in-kind state match.

Scope of impact: state specific.

Key Theme—Child Care/Dependent Care

Milestones:

- High school teens were involved in the Teen Child Care Providers Initiative, a service learning project that focuses on the mastery of child care principles and practices. Through this project, teens gained a new level of understanding of principles of child development, child guidance, and developmentally appropriate practices.

Outputs/Outcomes/Impacts:

- 2,000 adult and teen childcare providers participated in the programming this year.
- Child care sites in 20 communities that received support from Cooperative Extension Educators enrolled 4,000 children.
- Teens participated as classroom assistants in childcare settings in low-income communities, thus improving quality of care and staff resources for the young children in these programs..

Source of Funding—Smith-Lever.

Scope of Impact—state specific.

Key Theme—Financial Literacy

Research on-going in this area is USDA-funded Hatch project RI00711 ‘Impact of Workplace Financial Education on Employee Personal Financial Behavior and Productivity.’

Milestones:

- In a collaborative project between the Cooperative Extension and the Consumer Credit Counseling Services of Southern New England (CCCS-SNE) has led to the creation of the Center for Personal Financial Education.
- Thirty-seven high school teachers and credit union professionals were trained to deliver the High School Financial Planning Program. Twenty-five hundred newsletters were distributed to middle and high school teachers in Massachusetts, Connecticut and Rhode Island to promote youth financial education. In addition, 83 college freshman received money management and credit education as part of a pilot project for a new mini-course to be delivered on-line.
- In a collaborative initiative between Cooperative Extension and AES, the educational units are being incorporated into an experimental study of the impact of workplace financial education on financial behavior, and employee productivity.

Outputs/Outcomes/Impacts:

- Financial training of youth and families will help reduce the bankruptcy rate and create individuals and families with better fiscal decision-making tools.

Source of funding: CE, AES; grant from CDNE Foundation; support from CCCS-SNE.

Scope of impact: National.

Stakeholder Input Process

Stakeholder input is derived by a suite of different venues. The Plan of Work attempted to classify these under eight categories. In general, we rely on existing statewide organizations to provide input on our plan-of-work, cooperative approaches and our educational priorities.

We continue extensive exchanges with myriad water quality and conservation groups, including active coordinated projects in 2001 with RI Partners for Resource Protection, RI Grow Smart Education Subcommittee, RI Chapter of the American Planning Committee, RI Dept. of Health Source Water Assessment Committee, RI Natural History Survey, Natural Resource Conservation Service, Rhode Island Builders Association, Soil Scientists of Southern New England, Rhode Island Independent Contractors Association, RI Chapter of the American Water Works Association. Similarly, our water quality program coordinates closely with a host of state agencies and commissions including the RI Departments of Administration, Environmental Management, Transportation and Health and the RI CRMC and the Water Resources Board. At the Federal level we work closely with EPA Region I, the Department of the Interior and USGS. At the local level we rely on focus groups, watershed councils, project specific committees of town officials, Soil Conservation Districts and citizen groups for stakeholder input. Local organizations include: RI Chapter of Nature Conservancy, Audubon Society of RI, local land trusts, Save the Bay and the Environment Council of Rhode Island. Within our programs that use volunteers (i.e., Home-A-Syst and Watershed Watch) we host gatherings throughout the year to listen to stakeholder needs and to receive feedback on our programs. All of our programs have program specific steering committees that consist of representatives from the private sector, local and state government, citizen groups, and research scientists from the RI AES.

The establishment of an active Program Leader group was a further improvement in stakeholder listening, bringing direct faculty and educator representation to bear on the Director's decision-making (see Administrative Accomplishments, below).

A new Director joined the Station on July 1, 2001, and a new Associate Director began on October 15, 2001. This is creating opportunities for many positive changes within the Station and Cooperative Extension.

Program Review Process

Program review, including project merit and peer review, are the responsibility of the Director and five Program Leaders (see Administrative Accomplishments, below).

Projects are awarded through a competitive, outcome-oriented annual request for proposals. Project proposals are peer reviewed by scientists external to URI and by the program leaders. They are prioritized based on anticipated outcome (merit), as well as goodness of fit to the program areas, quality of science, integration with extension, and multistate collaboration. Projects normally run 3 years, and funding normally includes support for graduate students, a small operating budget, and travel. Station funds also support a limited number of support staff for agricultural operations as well as partial support for other research associates and assistants.

We include the request for proposals used in FY 2001 for projects to be funded as of FY 2002 (appendix A) to provide details of the entire process, including statements of priority research areas (based on the Plan Programs), and the specific instructions on target audience and outcome orientation. The RFP also includes complete documentation of procedures used for project review in the Station. The FY02 is essentially the same as that used for FY01.

In addition to federal formula funds, all of our programs depend in part on external funds. We submit proposals to competitive grant programs primarily through CSREES, EPA, NIH, NSF, DOC, and the State of Rhode Island. These proposals are generally peer reviewed and funding is merit based. We gain insights into the merit of our work from the feedback and assessment we obtain from the proposal process, along with the reviews we receive from annual and final reports that are required by the granting agencies.

While we have moved relatively far in repositioning the approach used by the Station—from a near entitlement, curiosity-driven research approach with an annual disbursement of research funds to academic departments, we have moved to a program and project based, outcome-oriented competitive process—we have not made as much progress on the Extension side. This is due in part to the relatively short time that we have had (the Station evolution took over 3 years), and in part to the high percentage of Extension funds devoted to long-term personnel (the average length of employment of current RICE educators is over 27 years). The clear reorientation of the Station's portfolio toward outcomes realized by specific target audiences provides an equally clear set of opportunities and needs for extension to respond. This is now the top priority for Extension administration, i.e., to review all current Extension assignments and budgets in light of merit review (augmented by external analysis), and in light of mandates to integrate with research and across state lines.

Evaluation of the Success of MultiState, Multi-institutional, and multidisciplinary activities, and Joint research and extension Activities

Did the planned programs address the critical issues of strategic importance, including those identified by the stakeholders?

We believe the answer to be yes to activities conducted in 2001. We have clearly completed a reorientation of AES funding to outcome-based, with a clear focus on target audiences. We now require further management refinements to follow-up on this commitment, to verify that intended milestones are addressed on a project-by-project basis, and that target audiences remain involved through greater extension involvement.

Did the planned programs address the needs of under-served and under-represented populations of the state?

To the best of our abilities, yes. We have attempted to develop a full range of programs that serve all segments of society, without regard to community, economy, or scale. Our agricultural programs provide benefits to all through the success of new biological control releases and the development of improved plant and animal strains. Aquaculture research and outreach affect large industry leaders, but also respond to very small-scale producers with equal intensity. Food safety and nutrition continues to be aimed at populations in greatest need, particularly in economically challenged communities and among the elderly. Water quality and natural resource management affect all Rhode Islanders. And our sustainable communities initiatives are particularly sensitive to addressing the needs of our 22 (of 39) rural towns.

Did the planned programs describe the expected outcomes and impacts?

We believe that we have made substantial progress in doing this, particularly considering that we are in the 2nd year of a substantial change for our organization, and in light of an extraordinarily austere budget at the University. Procedural adjustments in 2000 have effected a virtually complete reorientation of the Station to outcome-based funding, and have committed the land grant programs in Rhode Island to substantive management changes to keep projects on track toward specified performance targets.

Did the planned programs result in improved program effectiveness and/or efficiency?

It is too early to tell, but the number of outputs, outcomes, and impacts listed above suggests that we are productive and generally on track with CSREES objectives and the intent of the RI POW.

Multistate Extension Activities

Most of our programs coordinate and develop programming with sister programs in other states.

The presence of a USDA-APHIS approved insect quarantine on campus serves as a regional focal point for biological control efforts involving new species, with particular and nationally unique emphasis on invasive plants and pests of ornamental plants. Programs in horticulture, turfgrass management, and aquaculture are all increasingly multistate, with focus on regional annual meetings, as highlighted under the key themes statements, above.

URI Watershed Watch cooperates with Extension Programs from the University of New Hampshire and the University of Maine through the New England Regional Monitoring Collaborative. Watershed Watch also works closely with the UNH CE in the coordination of regional lakes conferences and regional and national volunteer monitoring conferences. The URI Municipal Watershed Management Program coordinates with the NEMO (Nonpoint Education for Municipal Officials) program from Cooperative Extension of the University of Connecticut. The URI Home-A-Syst program develops training materials in conjunction with CE programs from across the Northeast. In addition, the URI Onsite Wastewater Training Center participates in the Consortium of Institutes for Decentralized Wastewater Treatment. The Consortium has twenty-two member institutions throughout the US and Canada, these are listed in Section A: Multi State Extension section. In August, 2000, URI was awarded a regional “406” multi-state, 4-year project. URI is lead institution on the project, which unifies water quality research and outreach programs at the six New England land grants.

Our outreach efforts in food safety, nutrition, and youth programs all benefit from annual conferences, presentations made across state lines, and the multistate nutrition projects.

Integrated Research & Extension Activities

To the fullest extent possible, all RIAES research projects are now committed to full integration with extension. That is, all projects are funded on the basis of outcomes, which are expected to occur when specified target audiences use the outputs of research to accomplish specific performance goals. We have attached the project guidelines for FY01/02, which were adapted with minor changes from those established in January 2000, to document the extent of this commitment to full integration and full outcome-based funding. We have also attached the FY01 RIAES project portfolio (continuing or new projects that have completed RI review and approval procedures and are now approved or awaiting approval through CRIS) to document the complete identification of target audiences, specified outputs, and outcomes, which form the basis for Station funding decisions. The expenditure data for Integrated Activities (Hatch Act Funds) (attached) reflect less than 100% integration due to the continuation of projects begun before implementation of AREERA. We have refocused those projects that will continue beyond 2001 to move them toward full identification of target audience, outcome, and performance goals, such that we believe the Station will approach 100% integration within the lifetime of the current plan.

Certainly, RIAES currently exceeds the 25% requirement. However, given existing CSREES guidance on mechanisms for accounting, we are reporting a conservative 25% estimate of integration at this time.

Certainly, the within-state integration of AES and CE projects would be advanced by greater success in implementing research-related integrated multistate projects in obvious areas such as water quality, IPM, land-use planning, aquaculture, apples, dairy, etc. Rhode Island had been attempting to provide regional (at least, New England) leadership in this area, and will continue to do so under its new administration.

Administrative Accomplishments and Results

A transitional management team consisting of seven program-area advisors and the Director was organized in September 1999, to guide overall changes required by AREERA. It refined guidelines for AES projects, incorporating all aspects of the new AREERA requirements, and issued a formal revision in January 2000.

Six Program Leaders replaced the transitional team in September 2000. Given the distribution of research and outreach activities, the Program Leaders were assigned responsibilities as follows:

Goal 1: An agricultural system that is highly competitive in the global economy.

Program Leader 1: Sustainable agriculture.

Goal 2: A safe and secure food and fiber system.

Program Leader 2: Animal Health & Aquaculture

Goal 3: A healthy, well-nourished population.

Program Leader 3: Food Safety & Nutrition

Goal 4: Greater harmony between agriculture and the environment.

Program Leader 4: Natural Resources

Goal 5: Enhanced economic opportunity and quality of life for Americans.

Program Leader 5: Sustainable communities

Program Leader 6: Children, youth, and families

Guidelines for RIAES projects were modified to conform to AREERA in January 2000, with further refinements in August 2000 and April 2001. A competitive RFP replaced an open-application procedure for FY01 (**Appendix A**). All projects approved for FY01 funding conformed to the new guidelines (**Appendix B**).

A joint publication with RI Sea Grant was initiative in November, with both a print and a web version (see www.uri.edu/41N). The RIAES web site was updated to include an on-line description of current research programs and projects (see www.riaes.org).

The Director assisted in drafting a bill to provide for line-item match for RIAES and RICE, developed an extensive folio of information on programs, and testified before the RI House Finance Committee. Support from the University was otherwise weak and the bill died in Committee. It was reintroduced in 2001 with a promise of more active University support.

All RIAES projects are now incorporated into an Access database, including project descriptions, full project proposals, reviewer data and reviews, and related publications and external grants. Paper copies are also on file as required by regulations.

A Strategic Plan for an integrated Office of the Director of Land Grant Programs was submitted to University administration in November 2000 (**Appendix C**). The Plan outlined major administrative concerns and strategies for addressing them. It also provided a proposed new table of organization, patterned after the University of California system, with a request for an additional position of Associate Director.