Focus Area:
Sustainable Landscaping

**National Theme:
Pollution Assessment and Prevention
New England Regional Review
October 16, 2007**

http://www.usawaterquality.org/newengland

Situation

- New England - experiencing high rates of conversion of agricultural and forest lands to residential

- Residential lands – can have high rate of agrichemical application within a watershed

- Residential landscaping - major industry in the Northeast

- Residential landscape management practices – great potential to negatively impact water resources in NE

- Irrigation demands for home lawns and gardens threaten the viability of rural water supplies

Situation: Needs Assessment

Surveys Utilized

– UConn Fertilizer & Pesticide Use Survey
– UME (with DEP)
– URI Healthy Landscapes
– UVM – Homeowner Surveys

Results* from surveys indicated:

– 35% fertilize 4-6 times/year (single survey)
– 37% respondents used combination (fertilizer/weed or pest products)
– 80% respondents willing to change a yard care practice for water quality protection

*average from multiple surveys

http://www.usawaterquality.org/newengland

Goals

1. To reduce surface runoff and minimize leaching of nutrients and pesticides through promotion of "smart" landscaping techniques

2. To facilitate the collaboration between research, Extension and education both within individual states and throughout participating New England states

3. To strengthen state programs throughout New England through regional in-service training, sharing of resources, and identification of needed research, extension programs and funding.

http://www.usawaterquality.org/newengland

Inputs: Focus Group

Focus Area Participation

- Karen Filchak, Facilitator, Roy Jeffrey and Karl Guillard, University of Connecticut
- Laura Wilson, University of Maine
- Julia Peterson and Jeffrey Schloss, University of New Hampshire
- Alyson McCann, Holly Burdett, Marion Gold, University of Rhode Island
- Jurij Homziak, University of Vermont

http://www.usawaterquality.org/newengland

Inputs: Partners

Agencies

- Departments of Environmental Protection (CT, RI, VT, NH, ME)
- Conservation Districts (ME, NH, RI)
- Natural Resources Conservation Service (ME, NH, VT)
- Water Districts
- Resource Conservation and Development
- Dept. of Resources and Economic Development
- Department of Transportation

Inputs: Partners

Organizations

- Environmental Landscape Network
- Stamford Arboretum
- Community based regional river basin planning teams
- The Nature Conservancy
- Nursery and Landscape Association
- Americorps
- Rhode Island Landscape Professionals
- Save the River, Save the Hills

Landscape professionals

http://www.usawaterquality.org/newengland

Inputs: Partners

Universities

- Universities of Connecticut, Maine, New Hampshire, Rhode Island and Vermont - Cooperative Extension, Sea Grant, Master Gardeners, Depts of Plant Science, Natural Resources, GreenShare Programs
- Plymouth State University

Towns/Municipal Projects

- North Kingstown, RI
- Englesby Brook, VT
- East Lyme, CT
- Integrated Grant – 5 Coastal Towns

Municipal officials

http://www.usawaterquality.org/newengland

Inputs: Leveraging

TOTAL $2,026,500

Grants
- National - $1,148,000
- State - $854,500
- Private - $24,000

University Faculty & Staff – approx. 2 FTE's

Leveraging

Program Support

– Over 8200 Master Gardener/volunteer hours in outreach education

– $153,900 value of volunteer hours*

– Over 220 homeowner hours on buffer installation

– Over $6000 from landowners on buffer construction

– Municipal employees and Town Officials

– Plants & materials donated by nurseries

*Rate based on: $18.77/hr - 2006

Master Gardener volunteers

http://www.usawaterquality.org/newengland

Audiences

- Homeowners
- Master Gardeners
- Local decision-makers
- Landscapers/Groundskeepers
- Commercial Businesses / non-residential property owners
- Lake associations
- Irrigation Contractors
- Small Acreage Farms
- Faculty (National conferences)
- Students (college and high school)

Homeowners

http://www.usawaterquality.org/newengland

Outputs

Web Sites
Scholarly Curricula
Videos
Teaching Modules
Exhibits

Demonstration Sites

Research Sites

Presentations

RAIN GARDENS

in Connecticut

Publications

Training
Workshops

http://www.usawaterquality.org/newengland

NEW ENGLAND
Regional Water Program

CSREES
USDA

Outputs: Major Programs

State Programs

- <u>University of Connecticut</u> – L.A.W.N.S. – Learning About Water and Nutrient Strategies for the Home Landscape
- <u>University of Maine</u> – Watershed Stewards Program
- <u>University of Rhode Island</u> – Healthy Landscapes: Clean Water Starts at Home
- <u>University of Vermont</u> – Business Friends of Engelsby Brook
- <u>University of Maine, University of New Hampshire, University of Vermont</u> – L.E.A.P. – Lake Education and Action Project
- <u>University of New Hampshire</u> – Landscaping at the Water's Edge

http://www.usawaterquality.org/newengland

Research/Extension/Education

Turf Management

Rain Gardens

Master Gardener/Volunteer Activities

Shoreline Landscapes & Buffers

http://www.usawaterquality.org/newengland

Turf Management: Research

Developing objective testing methods to guide Nitrogen fertilization of turf

- Use of anion-exchange membranes to predict nitrate leaching losses from lawns

- Use of reflectance meters to estimate probability of exceeding water quality standards in percolate leachates from lawns

- Development of a verdure nitrate test for lawns to guide N fertilizer rates in the fall

- Development of a soil nitrate test to guide N fertilizer rates for lawns

http://www.usawaterquality.org/newengland
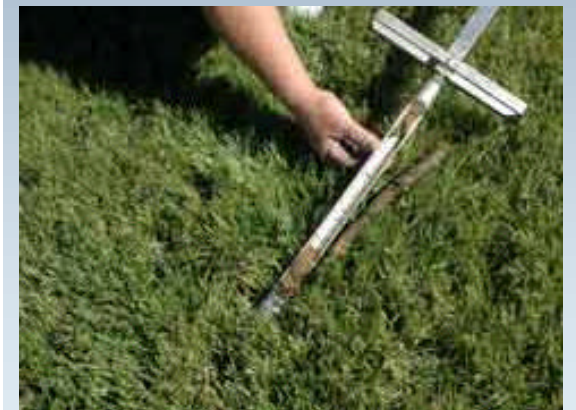
Turf Management: Extension

UCONN LAWNS: Learning About Water and Nutrient Strategies

Developed:

– To inform residents about sound nutrient management practices for lawns

– To provide residents alternatives to high input turf through fescues and non-lawn alternatives

Demonstration Sites

Websites

University of Connecticut Cooperative Extension System
Water Quality and the Home Landscape

Volunteer Training

http://www.usawaterquality.org/newengland

Turf Management: Extension

Regional applications

- URI Healthy Landscapes
  - Incorporated into tip sheets, website, demonstration sites

- 406 Integrated Grant
  - Research Recommendations for northern and southern New England piloted in local communities

North Kingstown, RI

http://www.usawaterquality.org/newengland

Turf Management: Education

- 1 M.S. level thesis completed
- 1 published abstract from scientific conference
- 4 annual University research reports
- 2 Manuscripts in preparation
- Interstate meeting to incorporate research into undergraduate education for future turf managers

UCONN graduate student collecting verdure tissue test

Teaching

Fundamentals of Turfgrass Science

http://www.usawaterquality.org/newengland

Rain Gardens: Research

- Based on research - a rain garden is an effective BMP in reducing flow (Prince George's Cty, MD) and pollutant loads (Dietz, Clausen- CT)

- Incorporated the concept of rain gardens to reduce residential runoff used in sustainable landscaping education

- UConn research, training and expertise – utilized regionally in Sustainable Landscape programs

UCONN Research and Demonstration Rain Garden, Haddam, CT

http://www.usawaterquality.org/newengland

Rain Gardens: Extension

- Demonstration Sites

- Publications

- Training and presentations

http://www.usawaterquality.org/newengland

Shorelines & Buffers: Research

- **NRI sponsored research:**
  - Mixed vegetated landscapes (grass, shrubs and trees) provide comparable nutrient removal to forest buffers (Addy et al.)
  - Sustaining on-site infiltration and water table dynamics enhances buffer treatment (Kellogg et al.)

- **Sea Grant sponsored research:**
  - Estuarine buffers can intercept and treat upland groundwater (Gold et al.)

- **319 sponsored research:**
  - Site conditions constrain riparian restoration performance (Clausen et al.)

http://www.usawaterquality.org/newengland

Shorelines and Buffers: Extension

LEAP – Lake Education and Action Program (Northern New England's landscaping & water quality programs)

– Volunteers –Buffer Brigade (UMaine)

– Publications –Shoreline Stabilization Handbook (UVM); UNH - training around use of the manual

– Demo sites – Buffers and Rain Gardens

– Trainings - hosted regional workshop on "Reducing and Preventing Beach Closures on Lakes and Rivers in Northern New England: Strategies for Detection, Correction and Financing" (UVM)

UVM's Watershed Alliance
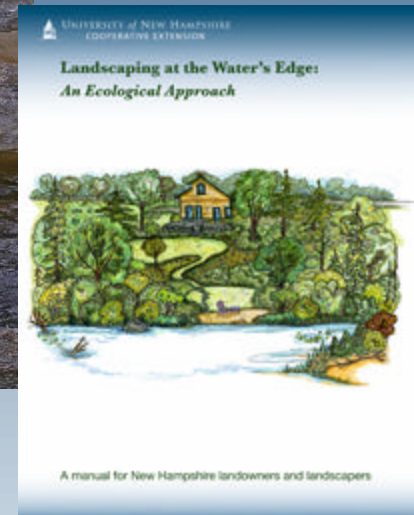
Publications

Buffer Brigade: volunteer training and demonstration sites

http://www.usawaterquality.org/newengland

Shorelines and Buffers: Extension

– URI Coastal Landscapes Training Program

- URI and UCONN researchers and Extension faculty trained policy makers and landscape professionals in BMPs for coastal buffer management

- Leveraged over $150,000 of funding from NOAA/Coastal Resources Management Council for Coastal Buffer Training

http://www.usawaterquality.org/newengland

Volunteer Training & Outreach: Extension

Volunteers extend the outreach capacity of Extension

- Teaching modules & community outreach
  - Turf Management
  - Shoreline buffers
  - Water Conservation
- Development & maintenance of demonstration sites
  - Rain gardens
  - Buffers
  - Turf
- Over 8200 MG/volunteer hours in outreach education

http://www.usawaterquality.org/newengland

Outcomes

Goal # 1: To reduce surface runoff and minimize leaching of nutrients and pesticides through promotion of "smart" landscaping techniques

Outcomes:

- 5400 linear feet of buffers installed at Maine lake
- Over 100 MG & volunteers trained for local outreach efforts
- Over 50 Landscape professionals trained as "Healthy Landscape Practitioners"
- Over 1200 MG trained in sustainable landscaping practices
- Over 500 practices changed by homeowners*
- Business community (Engelsby Brook, VT) adoption of low input grounds care resulted in estimated reduction of 0.45 - 0.93 metric tons phosphorus

*Practice changes included testing soil, reviewing turf management practices, reducing fertilizer applications, using slow release fertilizer, leaving grass clippings, introducing fescues and incorporating white clover into lawns

http://www.usawaterquality.org/newengland

Outcomes

Goal # 2: To facilitate the collaboration between research and Extension both within individual states and throughout participating New England states

Outcomes:

- New and strengthened partnerships - Extension, research, education, cross discipline, state and local agencies and organizations
- Integrated 406 Grant "Changing Homeowners' Lawn Care Behavior to Reduce Nutrient Losses in New England's Urbanizing Watersheds"
- Collaborated across CSREES programs and regions in the "Green-Blue Summit: Clean Water Through Residential IPM"

http://www.usawaterquality.org/newengland

Outcomes: USDA-CSREES Integrated Water Quality Grant

Changing Homeowner's Lawn Care Behavior to Reduce Nutrient Losses in New England's Urbanizing Watersheds

- $480,000/5 states/3 years
- Research/Extension/Education collaboration
- Research
  - Social Science Research – Behavioral Science
  - Environmental Research – Nitrogen Testing
- Extension Education: Program content and method based on behavioral science and environmental research
- Education: Graduate and Undergraduate research & coursework

http://www.usawaterquality.org/newengland

Accomplishments to Date

Social Science Research

- Interviews with 52 Opinion Shapers (in 5 states) completed and analyzed
- Neighborhood survey developed and sent to residents in 5 states

Environmental Science Research

- Drafted turf management practice recommendations based on water quality considerations
- Developing a soil nitrate test to guide N fertilizer rates on lawns

http://www.usawaterquality.org/newengland

Outcomes: Green-Blue Summit

Green-Blue Summit: Clean Water Through Residential Integrated
  Pest Management

A Northeast Regional Integrated Pest Management and Water
Quality Workshop

- Collaboration of 406 IPM and 406 WQ programs

- Collaboration of three Northeast 406 WQ projects

- Collaboration of Research, Extension and Industry

Alternative control of the oriental beetle – mating disruption

http://www.usawaterquality.org/newengland

Green-Blue Summit

NE WQ Sustainable Landscape Focus Group

- Planning Committee
- New England Presenters
  - John Clausen, University of Connecticut – *Design of Water Quality Monitoring Studies*
  - Brian Eisenhauer, Plymouth State University – *Positive Environmentalism: Social Science Research and Social Marketing*
  - Karl Guillard, University of Connecticut – *The Need for Objective Testing to Guide Nitrogen Fertilizer Research for Turf*
  - Jeff Schloss, University of New Hampshire – *Ecological Approach to Landscaping at the Water's Edge*

http://www.usawaterquality.org/newengland

Outcomes

Goal # 3: To strengthen state programs throughout New England through regional in-service training, sharing of resources, and identification of needed research, extension, and education programs and funding.

Outcomes:

– Regional in-service training - turf
– Regional resource packet (Brochures, PowerPoint Presentations, evaluation instruments, etc)
– New England Regional 406 Water Quality Integrated Research, Education and Extension grant funded

Focus Area Strengths

Extension/Research/Education Collaborations

Local to Regional Program Implementation
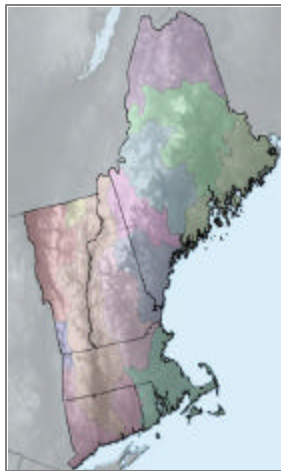
Regional to Local Program Implementation

http://www.usawaterquality.org/newengland

What's Next?

Full implementation of Integrated grant

http://www.usawaterquality.org/newengland

Thank You

Questions?

http://www.usawaterquality.org/newengland