



Implementing an Outdoor Water Efficiency Program



Managing Water Resources to Support North Carolina's Future



Irrigation Water Efficiency— Three Phases

Assess current conditions

- Surveys and metering

Implement customer educational initiative

- Landscape Audit

Establish minimum standards and incentivize upgrades

- Ordinances and financial benefits

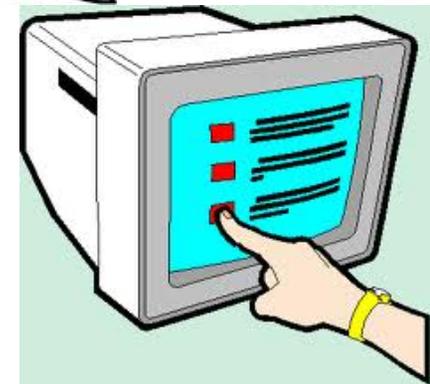
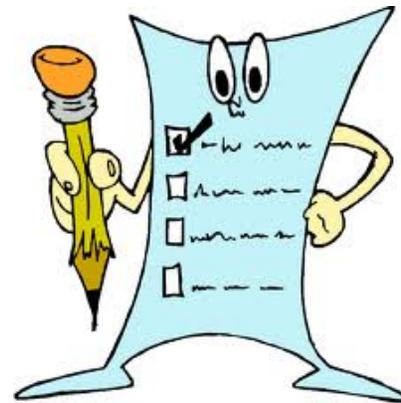


Water-Use Surveys

Necessary to understand the existing conditions

Surveys
sent to

- All customers or
- Customers with largest summer peak water usage.





Metering/Estimating Outdoor Water Use

Surveys should be as simple and quick as possible

- Estimate total irrigated area (i.e. 1000 ft²)
- Percentage of permanent and temporary irrigated area
- Percentage of turf under irrigation
- Estimate of irrigated water applied per week
- Irrigation by schedule, sensors, feel, or combination

Residential Irrigation Water Use Survey

Owners Name

Address

Landscape Characteristics

Total Irrigated Area (sq-ft)

Percent covered by:

Permanent Irrigation System

Temporary Irrigation System

Percent Irrigated Turf

Average Irrigation per week:

May (inches)

June (inches)

July (inches)

August (inches)

September (inches)

When is irrigation used? (i.e. schedule, sensor, feel, or combination)

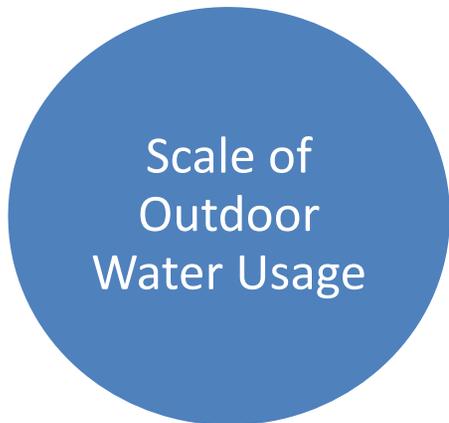
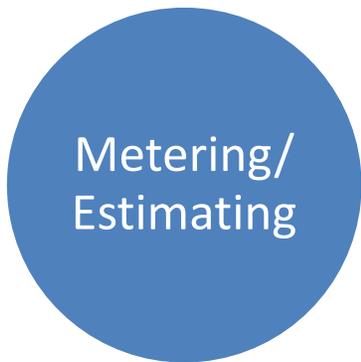


Metering/Estimating Outdoor Water Use



Separate irrigation metering is the law for new connections serviced by large community water systems.

Work with billing department for metering and estimating data





Implementing Educational Initiative

Provide educational information to all irrigation customers

- Offer landscape audits to all customers
- Encourage landscape audits to customers with largest summer peak water usage.
- Install model landscaping activities at town facilities.

Communication:

- During Water Audit
- Bill inserts, Local weather announcers, Gardening show hosts, Newspaper columnists, Gardening clubs, Cooperative Extension, Green industry businesses.





Minimal Auditing Program Requirements

Review past water bills.

Landscaped areas specific data,

- measurements,
- plant types,
- irrigation system (zones and controllers).

Review maintenance irrigation schedules, and sensor effectiveness.

Effectiveness of irrigation heads.

Education on simple landscape practices to increase water use efficiency.





Categories for Proper Landscape Water Management

Planning and
Design

Vegetation
selection

Efficient
irrigation
system

Soil analysis
and
amendments

Planning and Design

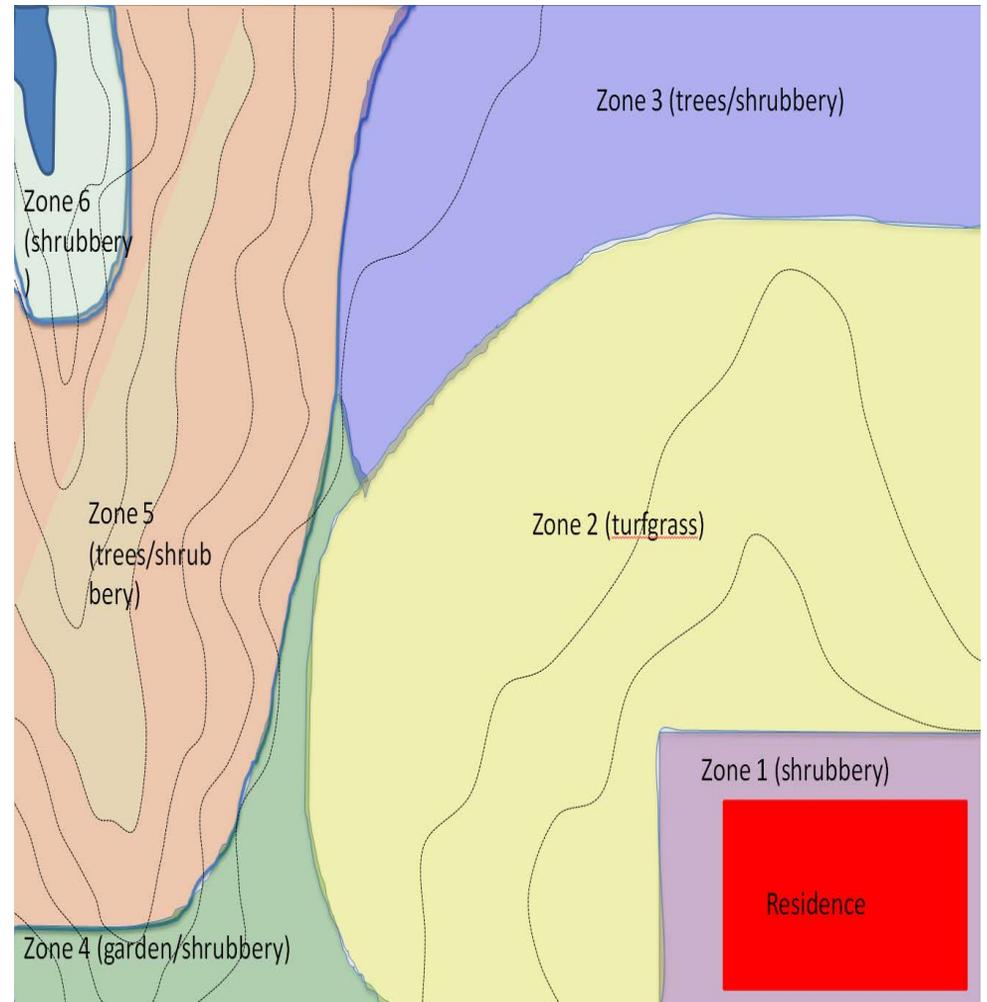
Survey and use existing contours

Create planting/hydro “zones”

Minimize earthwork

Reduce surface water flow velocity and runoff

Limit turf areas to appropriate conditions



Vegetation Selection

“All plants must be placed in an environment that meets their basic requirements” -USDA

- All scales
 - Nationally (Plant Hardiness Zone Map)
 - Single landscape area.



Turfgrass Selection

Cool-season species thrive at 60 to 75 degrees

- Excessive heat will damage roots



Warm-season species thrive at 80 to 95 degrees

- Excessive dryness will damage roots





During Drought Conditions

During drought conditions, turf should be watered and irrigated only to keep the turf alive.

- ½-inch water every two to four weeks
- Turfgrass will go dormant and turn a dull brown.
- Water immediately if the turfgrass turns bluish-gray.

Warnings During Drought!

- Avoid herbicides and fertilizers
- Avoid vehicle or foot traffic
- Increase mowing heights.



Irrigation Systems

Permanent Irrigation Systems

Pipe and nozzle layout!

- Avoid spray overlap by spacing nozzles appropriately
- Avoid spraying impermeable surfaces
- Avoid larger rooting trees

Water efficient nozzles

Maintain nozzles

Irrigation sensors (rain or soil)

Temporary Irrigation

- Hand watering (bucket or hose)
- Drip irrigation
- Water Syringing
- Temporary sprinklers.



Measuring Irrigation Efficiency

Measurement of irrigation rate

1. Distribute a few empty “catch” cans across the irrigated area.
2. Start time when irrigation begins.
3. End time once the catch can is full.

Provides:

- Irrigation time
- Distribution evenness



Fertilization/Liming Amendments

Native NC soils are generally acidic and low in nutrients

- Restrict plant uptake of water

Proper fertilization and liming will result in increased water uptake efficiency

- Minimal recommended application rates



NCDARS Agronomic Division Phone: (919)733-2655 Web site: www.ncagr.gov/agronomi															Report No: 09536						
 Soil Test Report <small>SERVING N. C. RESIDENTS FOR OVER 60 YEARS</small>										<small>Grower:</small> <small>Copies To:</small>											
<small>Received: 10/10/2011 Completed: 10/18/2011 Links to Helpful Information Wake County</small>																					
<small>Agronomist Comments</small>																					
Field Information		Applied Lime			Recommendations																
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year		Lime	N	P ₂ O ₅	K ₂ O	Mg	S	Cu	Zn	B	Mn	See Note				
FRONT					1st Crop:	Lawn	0	(1.0 lbs Nitrogen or EQUIV PER 1000 SQ FT)				0						↓			
					2nd Crop:	Lawn	0	(1.0 lbs Nitrogen or EQUIV PER 1000 SQ FT)				0						↓			
Test Results																					
Soil Class	HM% ¹	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI(1)	Mn-AI(2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO ₃ -N	NH ₄ -N	Na
MIN	0.66	0.95	10.2	84.0	1.6	5.9	166	106	56.0	23.0	151			132	132	45	30				0.1
Field Information		Applied Lime			Recommendations																
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year		Lime	N	P ₂ O ₅	K ₂ O	Mg	S	Cu	Zn	B	Mn	See Note				
BACK					1st Crop:	Lawn	30M	(1.0 lbs Nitrogen or EQUIV PER 1000 SQ FT)				0						↓			
					2nd Crop:	Lawn	0	(1.0 lbs Nitrogen or EQUIV PER 1000 SQ FT)				0						↓			
Test Results																					
Soil Class	HM% ¹	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI(1)	Mn-AI(2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO ₃ -N	NH ₄ -N	Na
MIN	0.27	0.95	8.8	83.0	1.5	5.6	124	92	54.0	24.0	130			267	267	63	60				0.1
Field Information		Applied Lime			Recommendations																
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year		Lime	N	P ₂ O ₅	K ₂ O	Mg	S	Cu	Zn	B	Mn	See Note				
HOGTA					1st Crop:	Garden,Flower	0	(7.0 lbs 15-0-14 or EQUIV PER 1000 SQ FT)				0						↓			
					2nd Crop:	Garden,Flower	0	(7.0 lbs 15-0-14 or EQUIV PER 1000 SQ FT)				0						↓			
Test Results																					
Soil Class	HM% ¹	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI(1)	Mn-AI(2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO ₃ -N	NH ₄ -N	Na
MIN	0.60	1.01	9.4	85.0	1.4	5.9	86	48	66.0	16.0	192			175	175	83	26				0.1

Mulching and Other Amendments

Mulching Offers:

- Soil moisture retention,
- Reduces of surface water runoff and soil erosion
- Impedes the growth of weeds

Inches of Material	Organic Material Needed to Cover 100 Square Feet
6	2 cubic yards
4	35 cubic feet
3	1 cubic yard
2	18 cubic feet
1	9 cubic feet
1/2	4 cubic feet

Other Amendments

- Herbicides reduce competition
- Insecticides reduce insect and nematode issues avoiding some disease issues.





Minimum Standards and Incentive Programs

Develop minimum standards ordinances

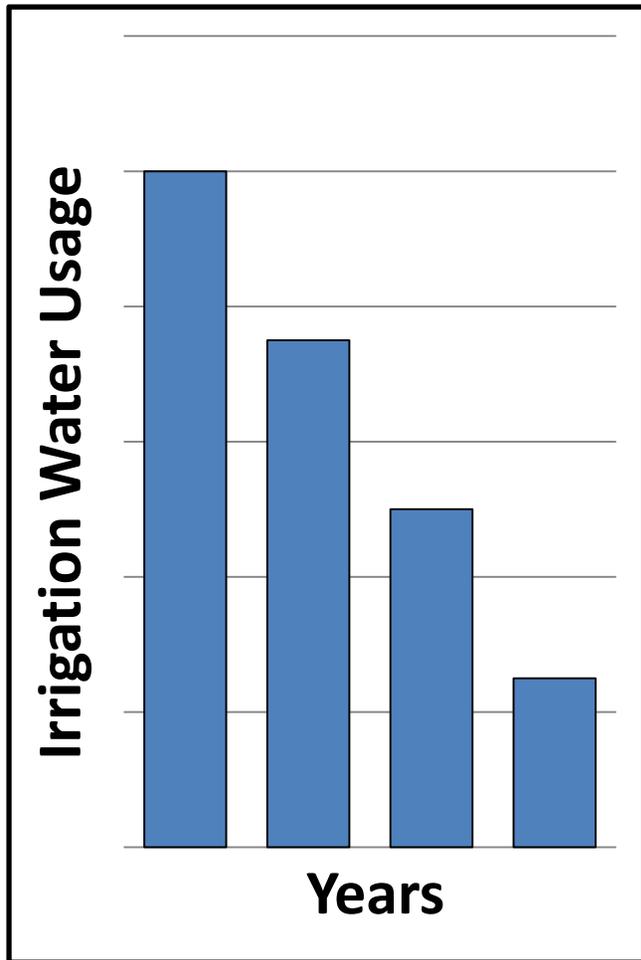
- Metering of permanent irrigation systems
- Avoid irrigating impermeable surfaces
- Installation of moisture sensors
- Reductions during times of droughts

Develop incentive programs with rebates, cost-sharing, or loans

- Replace inefficient nozzles
- Turf buy-back
- Encourage certain species
- Provide mulch to customers
- Installation of permanent irrigation systems



Achieve and Acknowledge Results



Set a reduction goal in water demand for landscape uses.

Document results in a system-wide report within 10 years.



Water Efficiency Program Report

10-Year report needs to include:

- Number and water use of dedicated irrigation meter accounts
- Estimated number and water use for unmetered landscape water use
- Number of surveys completed and response rate.
- Number of audits completed
- Details of educational programs
- Data on all incentive programs (type, acceptance, and cost)
- Estimates of water savings based on actual metered data (total and programmatic)
- The cost of administering irrigation efficiency program.





Conclusion



To effectively manage outdoor water use requires an understanding of the needs/wants of the customers in concert with an educational component to require and encourage responsible landscape water use management

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