Jordan Lake Nutrient Management

Introduction, Background, and Rules

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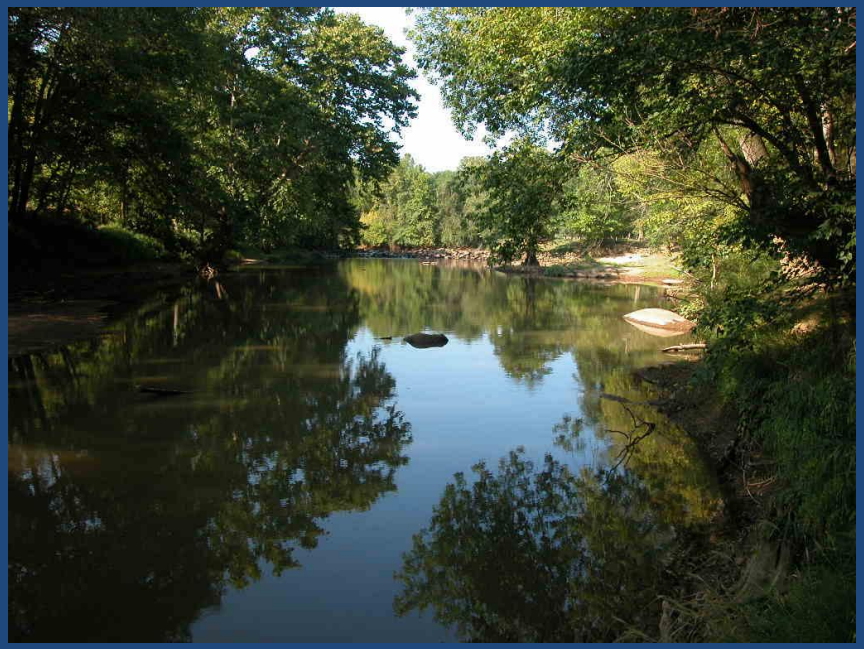
Where Does Your Drinking Water Come From?

Does it come from here?

Had you Rather Swim In

This

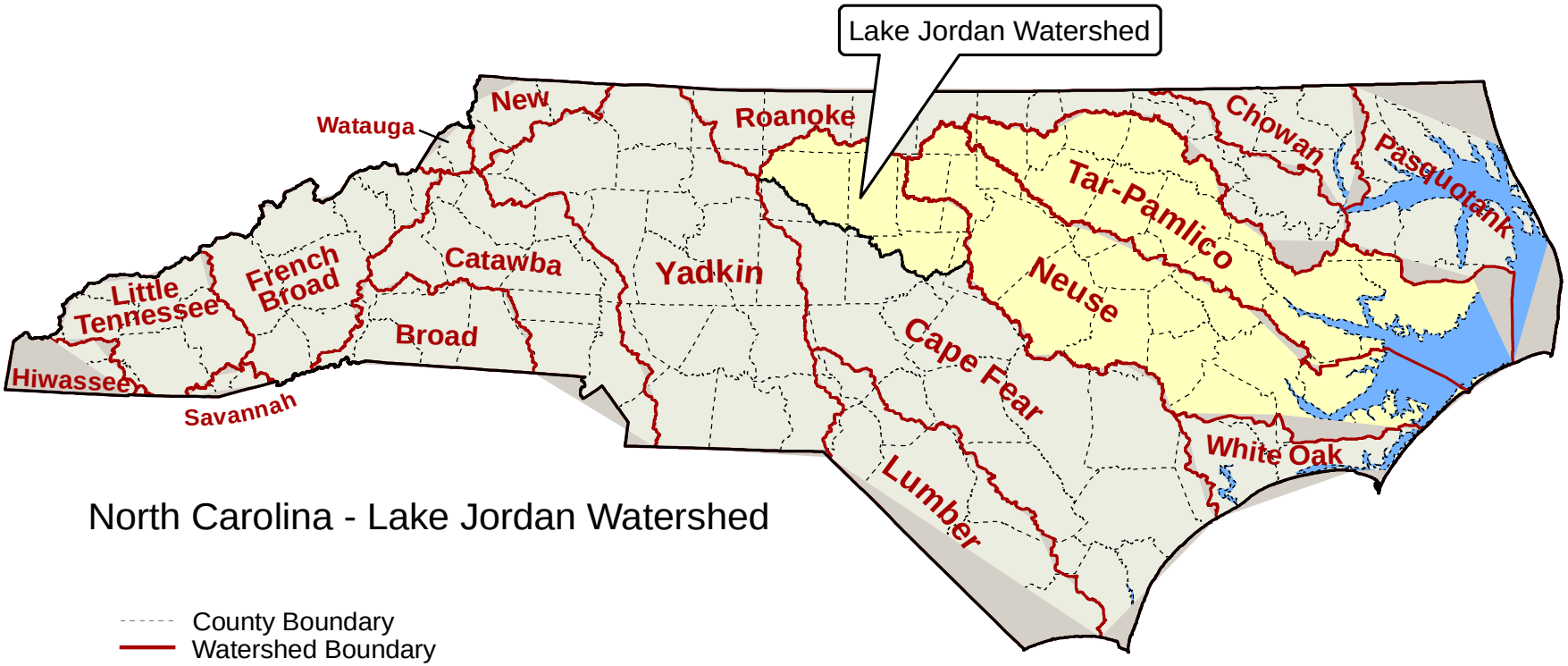


Or This

Is Water Related Recreation Important to North Carolina?

Is There a Relationship to Clean Water in Our Culture?

North Carolina Watersheds



North Carolina State University
Department of Soil Science
Produced: R.Austin, D.Osmond

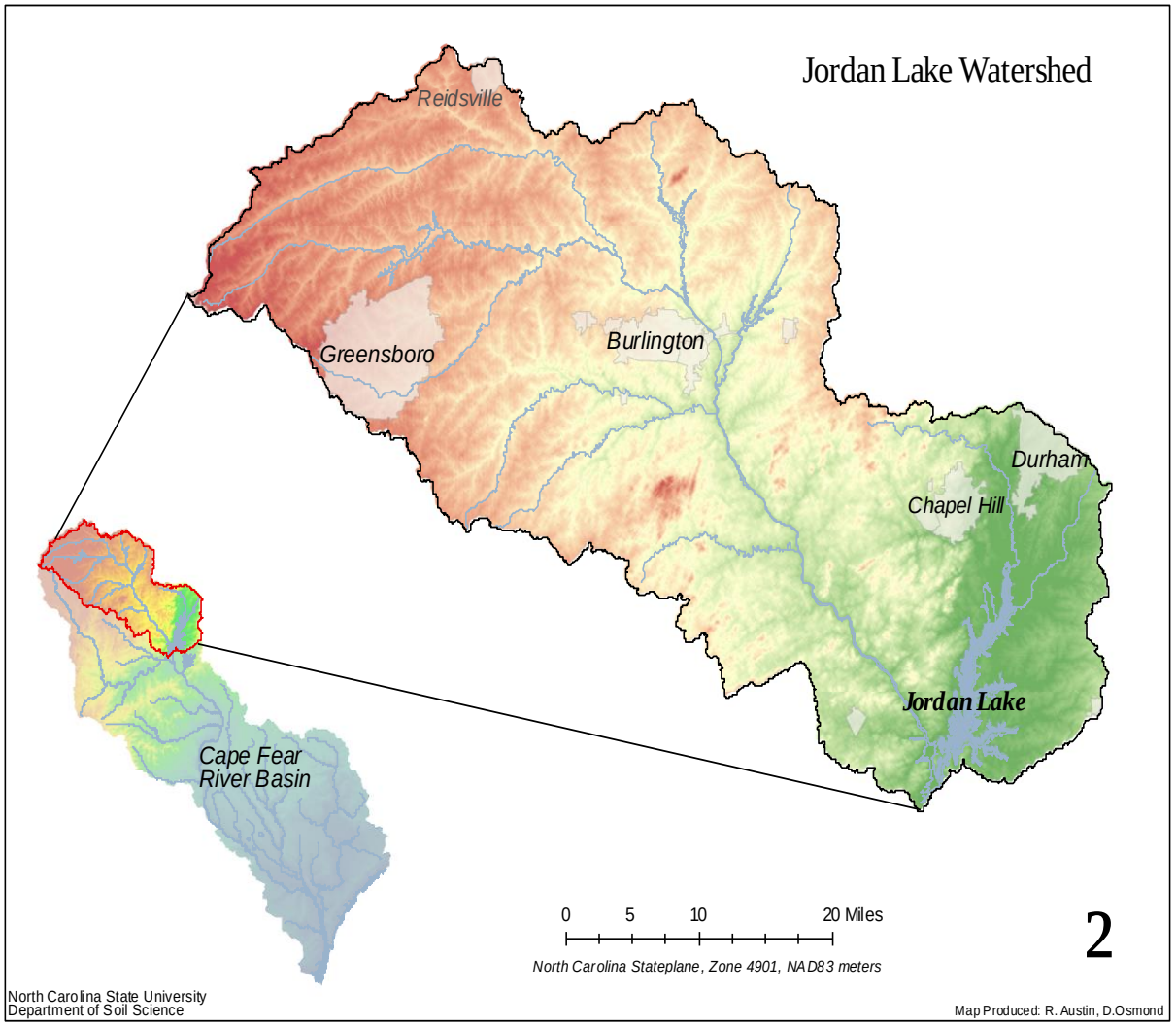
0 37.5 75 150 Miles

09.27.2006

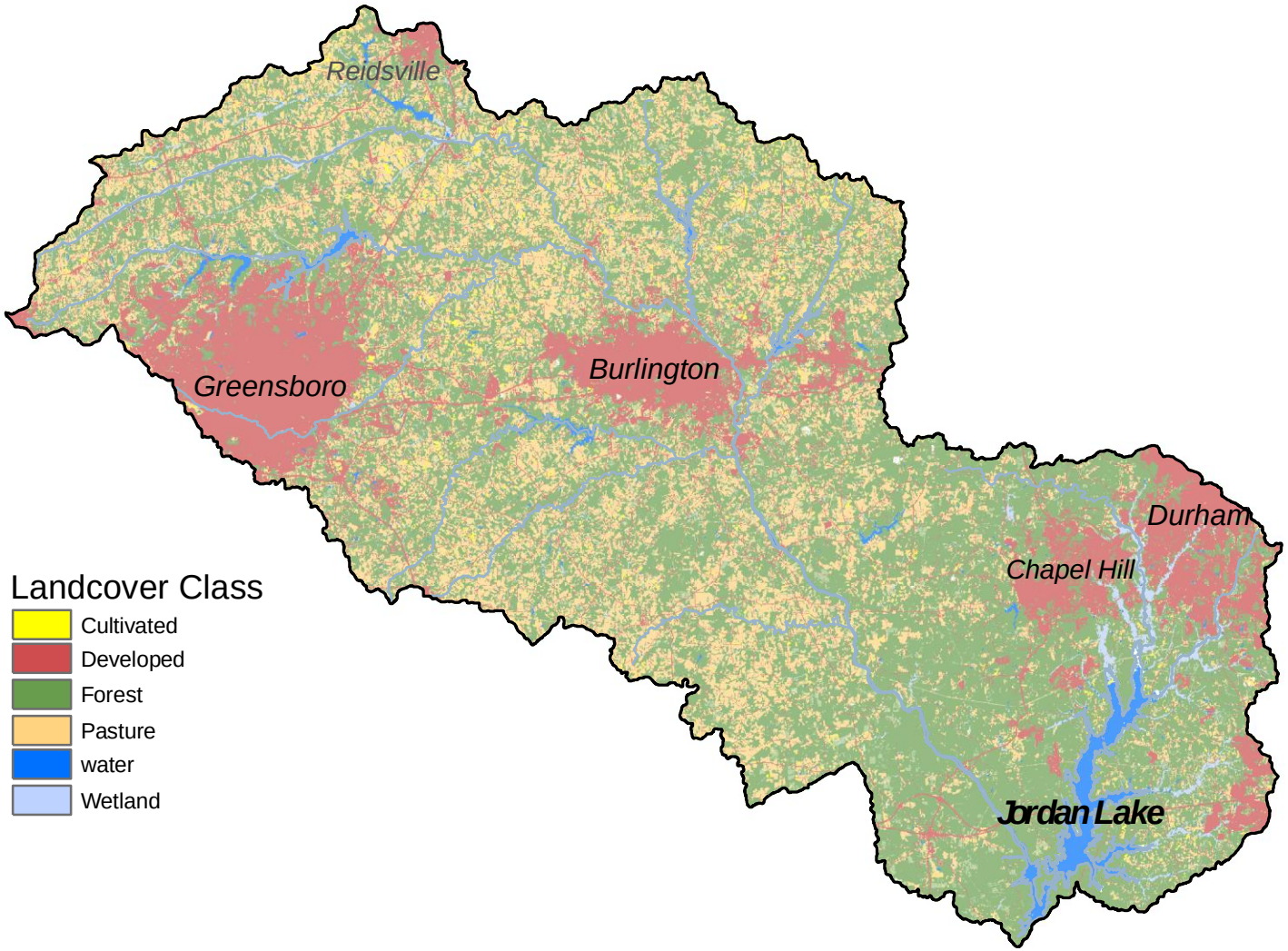
Jordan Lake Facts

- Created from Haw River and New Hope Creek
- Original name: New Hope Lake
- Named for Senator B. Everett Jordan
- 13,940 acres, 200 miles of shoreline
- Elevation 216 feet, 113 feet above stream bed
- 245 billion gallons of water on a typical day
- The reservoir was developed and is managed by the United States Army Corps of Engineers

Jordan Lake Watershed



Jordan Lake Watershed
2001 Land Use Land Cover

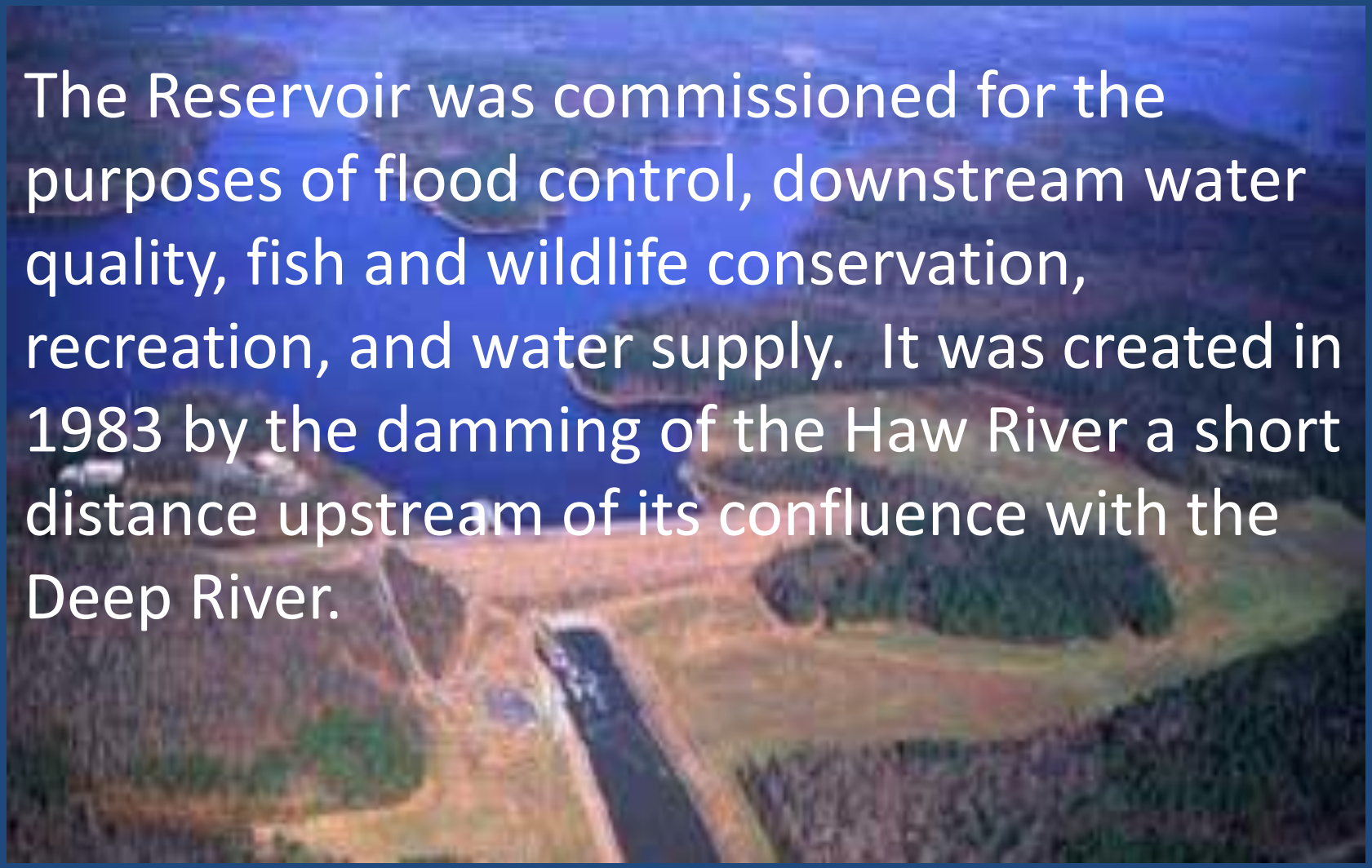


North Carolina Stateplane, Zone 4901, NAD83 meters

Map Produced: R. Austin, D.Osmond

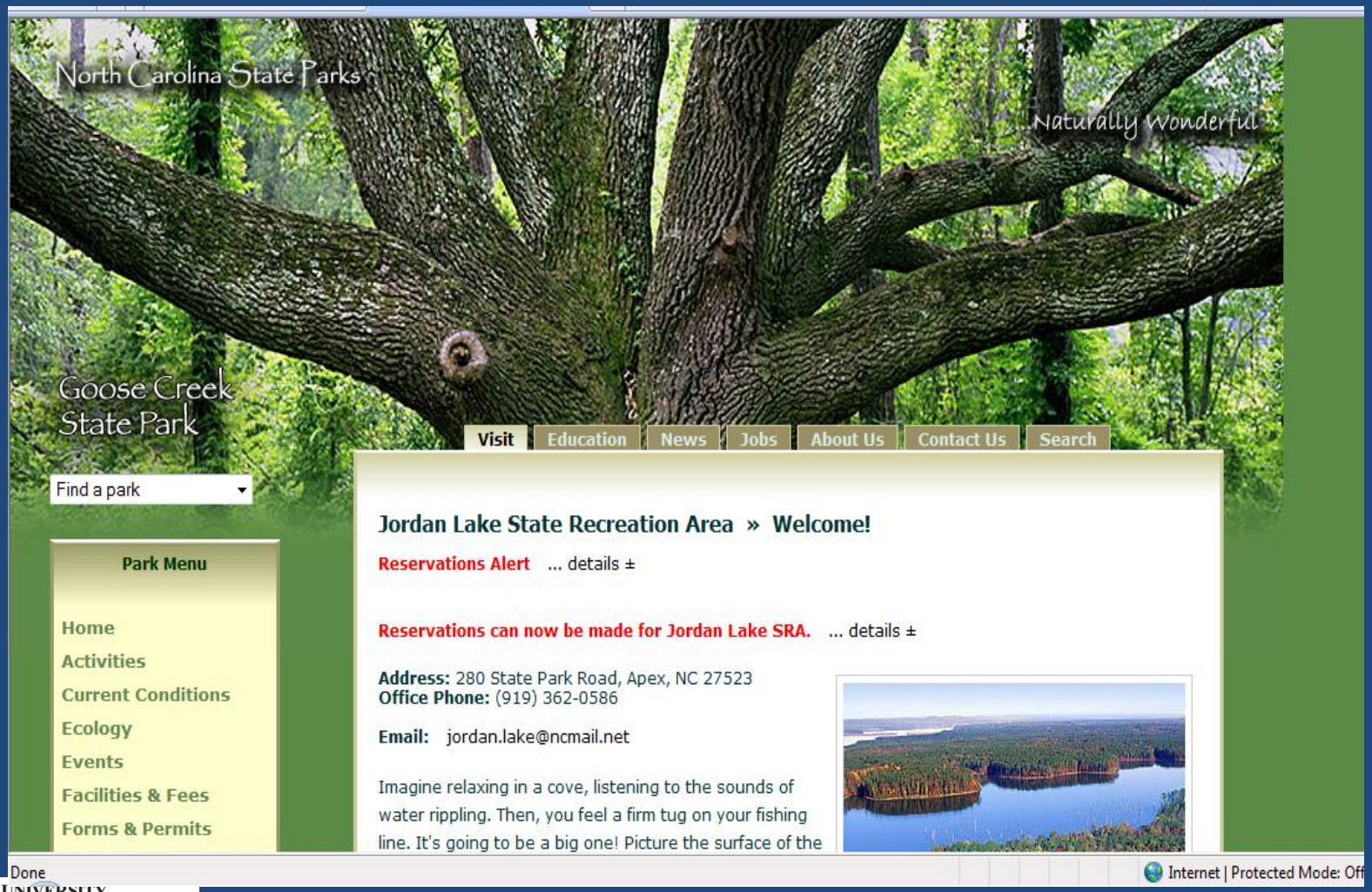
North Carolina State University
Department of Soil Science

Jordan Lake Purpose



The Reservoir was commissioned for the purposes of flood control, downstream water quality, fish and wildlife conservation, recreation, and water supply. It was created in 1983 by the damming of the Haw River a short distance upstream of its confluence with the Deep River.

Jordan Lake Camping



Jordan Lake Boating

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Jordan Lake Fishing

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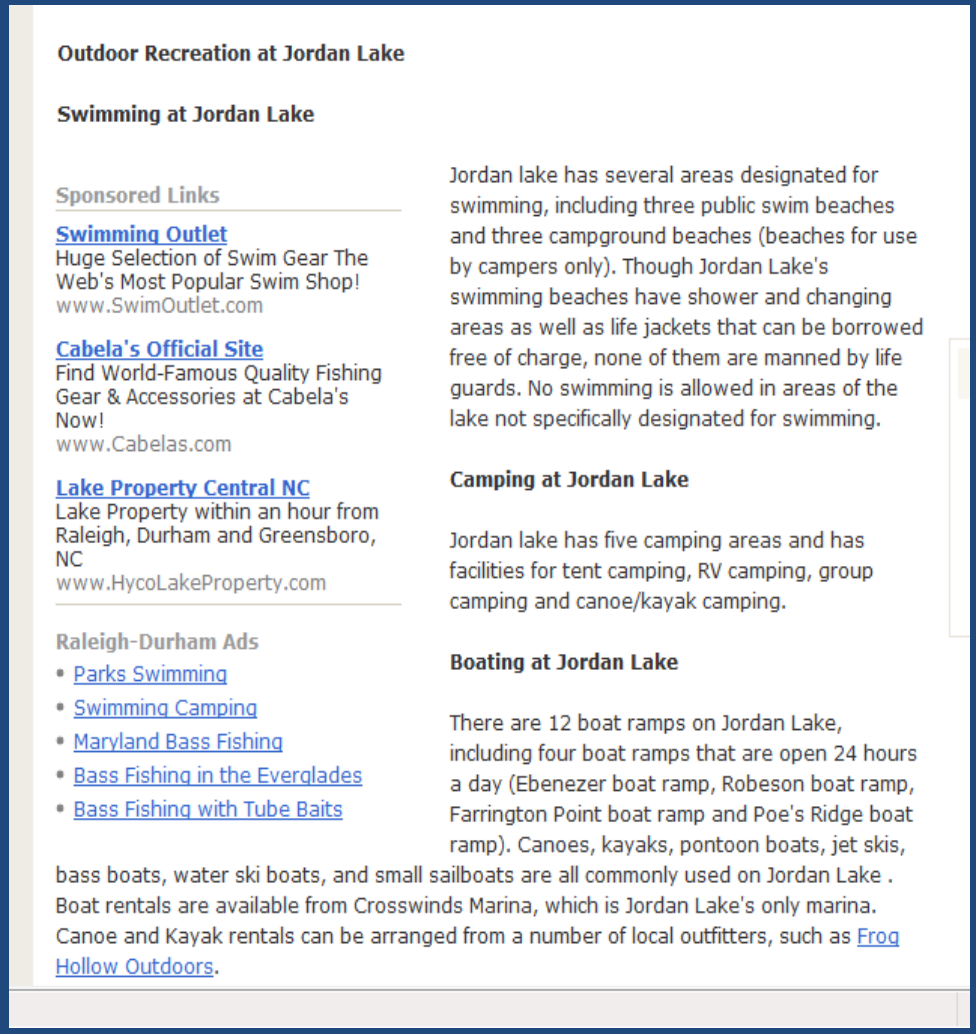
Jordan Lake Swimming



Outdoor Recreation at Jordan Lake

Swimming at Jordan Lake

Sponsored Links

Swimming Outlet
Huge Selection of Swim Gear The Web's Most Popular Swim Shop!
www.SwimOutlet.com

Cabela's Official Site
Find World-Famous Quality Fishing Gear & Accessories at Cabela's Now!
www.Cabelas.com

Lake Property Central NC
Lake Property within an hour from Raleigh, Durham and Greensboro, NC
www.HycoLakeProperty.com

Raleigh-Durham Ads

- Parks Swimming
- Swimming Camping
- Maryland Bass Fishing
- Bass Fishing in the Everglades
- Bass Fishing with Tube Baits

Jordan lake has several areas designated for swimming, including three public swim beaches and three campground beaches (beaches for use by campers only). Though Jordan Lake's swimming beaches have shower and changing areas as well as life jackets that can be borrowed free of charge, none of them are manned by life guards. No swimming is allowed in areas of the lake not specifically designated for swimming.

Camping at Jordan Lake

Jordan lake has five camping areas and has facilities for tent camping, RV camping, group camping and canoe/kayak camping.

Boating at Jordan Lake

There are 12 boat ramps on Jordan Lake, including four boat ramps that are open 24 hours a day (Ebenezer boat ramp, Robeson boat ramp, Farrington Point boat ramp and Poe's Ridge boat ramp). Canoes, kayaks, pontoon boats, jet skis, bass boats, water ski boats, and small sailboats are all commonly used on Jordan Lake . Boat rentals are available from Crosswinds Marina, which is Jordan Lake's only marina. Canoe and Kayak rentals can be arranged from a number of local outfitters, such as Frog Hollow Outdoors.

Jordan Lake Drinking Water

Town of Cary

Water Treatment

The Town of Cary produces drinking water from Jordan Lake at a treatment plant that it owns with the Town of Apex. Treatment capacity increased to 40 million gallons per day with expansion that was completed in 2002. The plant has been in compliance with regulatory standards since opening in 1993.

The water plant is six miles from Jordan Lake, which is part of the Cape Fear River basin. The lake was created to supply water regionally, control flooding, improve flow downstream, and provide recreation.

Annual Reports

Drinking Water Quality Report [text only html]– This brochure is mailed to all water customers as required by the U.S. Environmental Protection Agency. It summarizes test results and includes information on health effects. The report lists Town contacts and sources of additional information.

Water Treatment Lab Summary – This comprehensive laboratory report has test results for all parameters for finished water from the Cary/Apex Water Treatment Facility.

Treatment Process

The Cary/Apex Water Treatment Plant uses a relatively new process with special concrete treatment basins called Super-Pulsator Flocculator Clarifiers for removing

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Jordan Lake Wake Quality Problems

- Jordan Lake has been consistently rated as eutrophic or hyper-eutrophic since its impoundment in 1983.
- “Eutrophic” is an over-abundance of nutrients in the lake, primarily nitrogen and phosphorus, which may result in algal blooms and poor water quality.

Jordan Lake Problems

- The state began taking actions to address the nutrient problems early in the lake's history.
- The Environmental Management Commission designated the Reservoir a Nutrient Sensitive Water the year of its impoundment (1983), and imposed phosphorus limits on wastewater dischargers.
- The lake did not respond to these controls.

Jordan Lake Problems - 1998

Local · State · Nation · World · Politics · Obituaries · Green · Tech · Crime · Strange · Edu

Local News

Jordan Lake Swimming Area Closed

Posted: Jun 10, 1998

CHATHAM COUNTY — A beach at Jordan Lake is closed and the Chatham County Health Department doesn't know when it will reopen.

The Vista Point Campground is closed because of an outbreak of shigellosis. Officials suspect contamination in the water and the soil may have made several children who sick after swimming in the water.

It's the first time the serious bacterial infection has been linked to Jordan Lake. Chatham County Health Department Director, Wayne Sherman, says the area is closed to protect the public."The decision was made to close Vista Point Beach at Jordan State Park due to some confirmed cases of shigella related to some children that were camping."

Fourteen year old Adam Edmonds was one of those kids who, two weeks ago, spent a fun weekend at Vista Point. But ever since then he's been taking it easy, trying to recuperate from the bacterial infection."I had a great time all weekend and when I got home I had a headache, and my back was hurting from sunburn. And then I woke up the next morning really cold. I had the chills."There are four other confirmed cases of shigellosis in young people who swam in the waters off Vista Point.

Jordan Lake Problems - 2008

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Columnists: John Drescher | Barry Saunders | Ruth Sheehan | Road Worrier | Triangle Troubleshooter

Debris clogs Jordan Lake's coves

Raleigh man spearheads effort to clean up trash

BOOKMARK
BUZZ UP!
E-MAIL
PRINT
TEXT SIZE:

WADE RAWLINS - STAFF WRITER
Published: Thu, Sep. 18, 2008 12:30AM Modified Thu, Sep. 18, 2008 04:55AM

PITTSBORO -- When Tom Colson spotted a great blue heron at Jordan Lake recently, he was first delighted, then horrified.

The bird was standing on a mat of trash so thick it couldn't fish.

Colson, a Raleigh environmental consultant and hobby wildlife photographer, investigated more closely and found an even worse situation. Near where the Haw River flows into the lake, a half dozen shallow coves resemble floating landfills, collecting debris washed down the river over the years.

VOLUNTEERS NEEDED TO CLEAN UP LAKE

There is no land access, so volunteers with boats are especially needed.

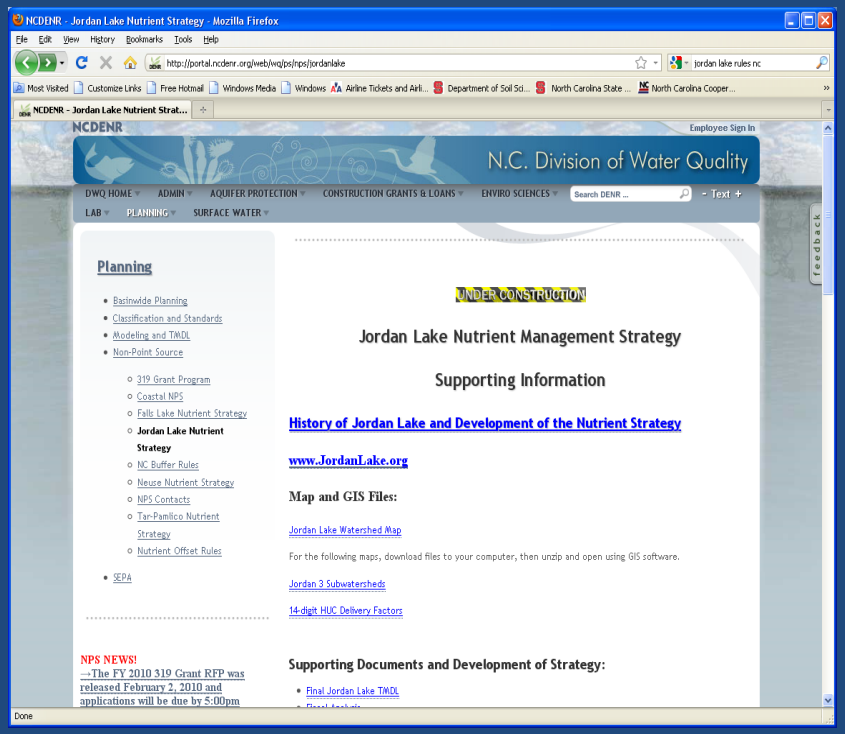
What: Help clean up a section of Jordan Lake

Where: About a 45-minute paddle from the Robeson Creek Boat Ramp, Chatham County's Waste

Jordan Lake is popular with boaters, fishermen and swimmers. It's also a source of drinking water. Near the northern end of the lake, the towns of Cary and Apex draw water and pump it to residents' taps, and other communities such as Durham and Orange County may use it in the future. Although those communities have treatment plants that purify the water, the

Jordan Lake: Rules Developed to Reduce Nutrient Loading

- In 2006 the Department of Environment and Natural Resources began developing rules to reduce nutrient loading to Lake Jordan
- Rules published 2007, with a 90 day public comment period
- Rules approved November 2008
- Rules signed into law January 2009



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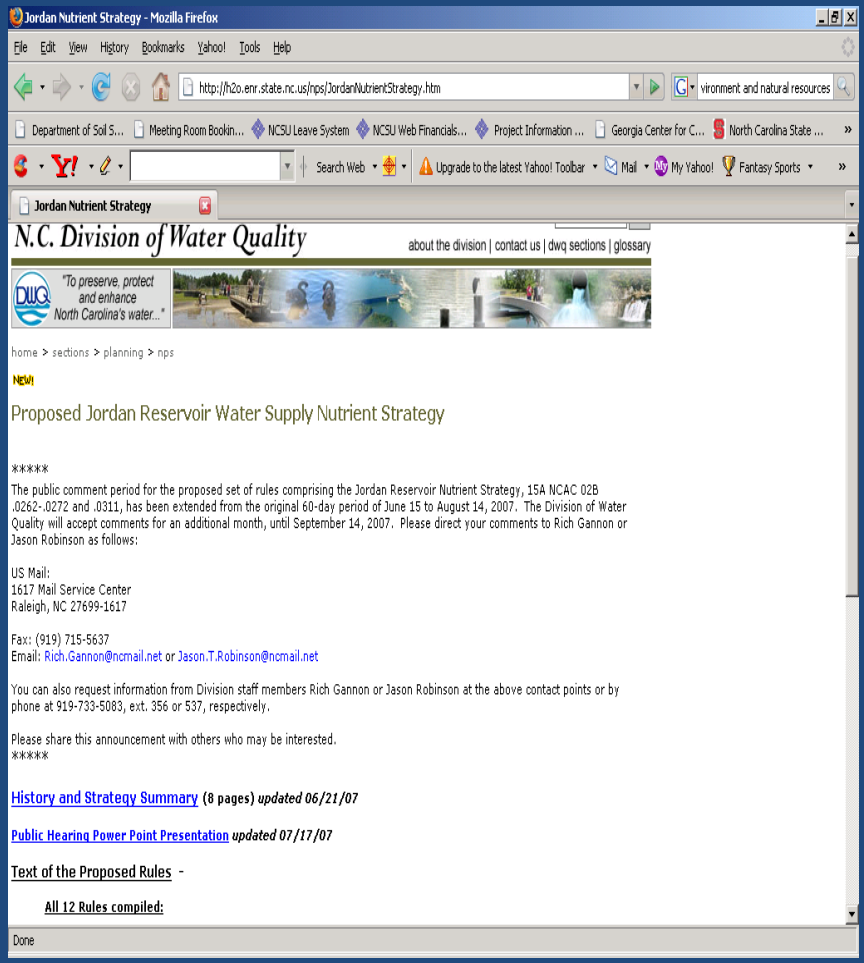
Jordan Lake Rules

- Old/New Development
- Waste Water Treatment Plants
- Nutrient Management
- Agriculture
- Buffer Protection



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Jordan Lake: Required Nutrient Load Reductions

- Nutrient Load Reductions required by the state of North Carolina from the 1997-2001 baseline period
  - Upper New Hope Sub Basin: 35% Nitrogen and 5% Phosphorus
  - Lower New Hope Sub Basin: 0% Nitrogen and 0% Phosphorus
  - Haw Sub Basin: 8% Nitrogen and 5% Phosphorus

Jordan Lake Rules

- Old/New Development
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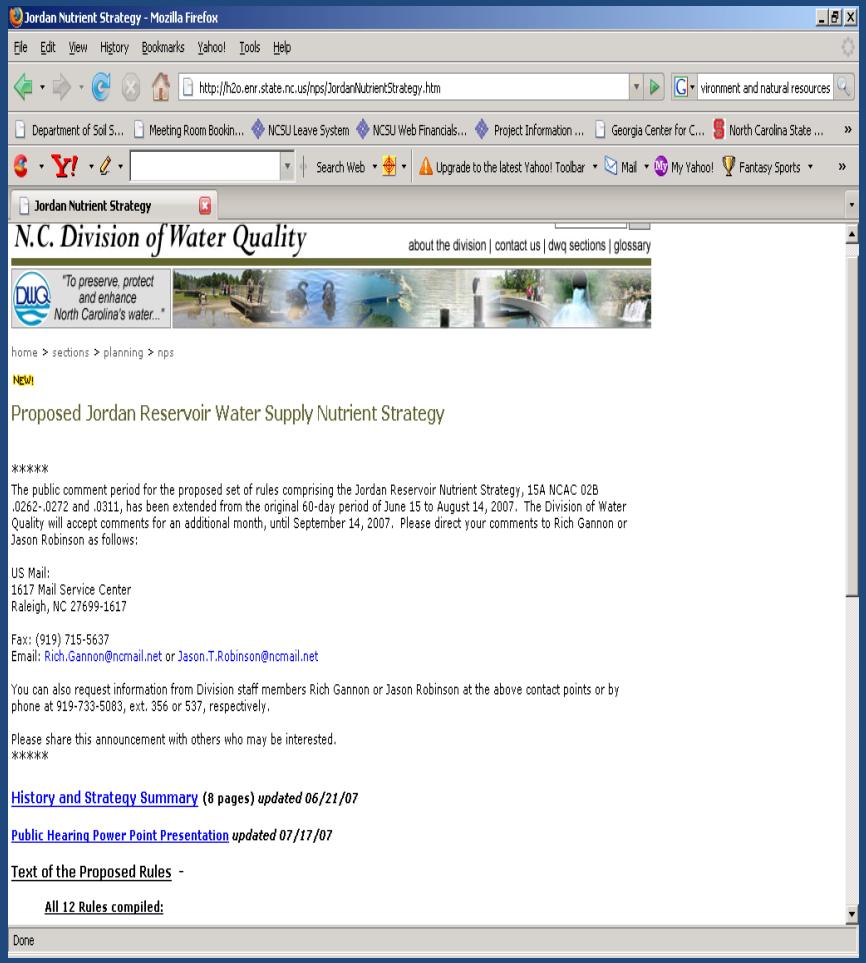

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Jordan Lake Nutrient Management Rule: Who Needs to Participate

- Applicators to any of the following lands:
  - Commercial cropland, including pastureland, regardless of acreage.
  - Commercial ornamental, floriculture, or greenhouse operations, regardless of acreage.
  - Golf courses, public recreational lands, road or utility rights-of-way, or other commercial or institutional lands that total at least five acres.
- Hired applicators who apply to a combined total of at least five acres per year.

Jordan Lake Nutrient Management Rule: What Do You Need to Do

- Attend nutrient management training

or

- Use a certified nutrient management plan written by a nutrient management planner

Jordan Lake Nutrient Management Rule: Who Does Not Need to Participate

- Homeowners are exempt if they fertilize their own lawns
- With the exception of homeowners, everyone who hires an applicator must ensure that the applicator has attended and completed the nutrient management class or applies pursuant to a nutrient management plan that has been approved by a designated technical specialist.

Jordan Lake Rules

- Old/New Development
- Waste Water Treatment Plants
- Nutrient Management
- Agriculture
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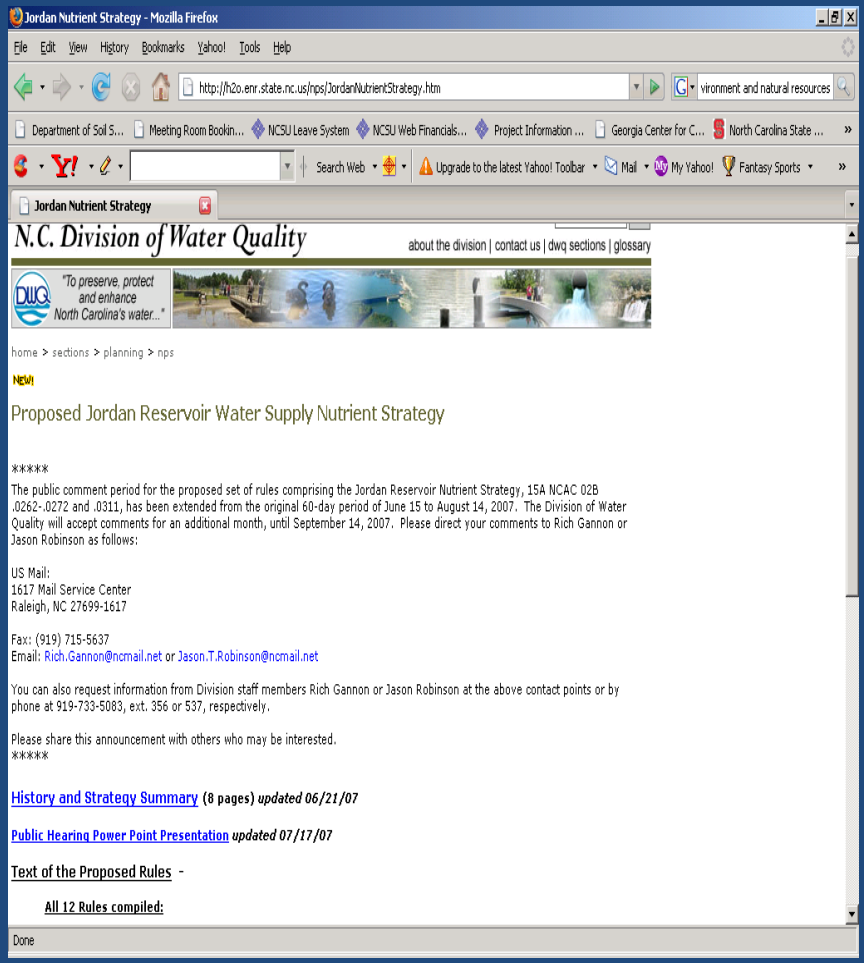

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Jordan Lake Agriculture Rule: Who Is Covered?

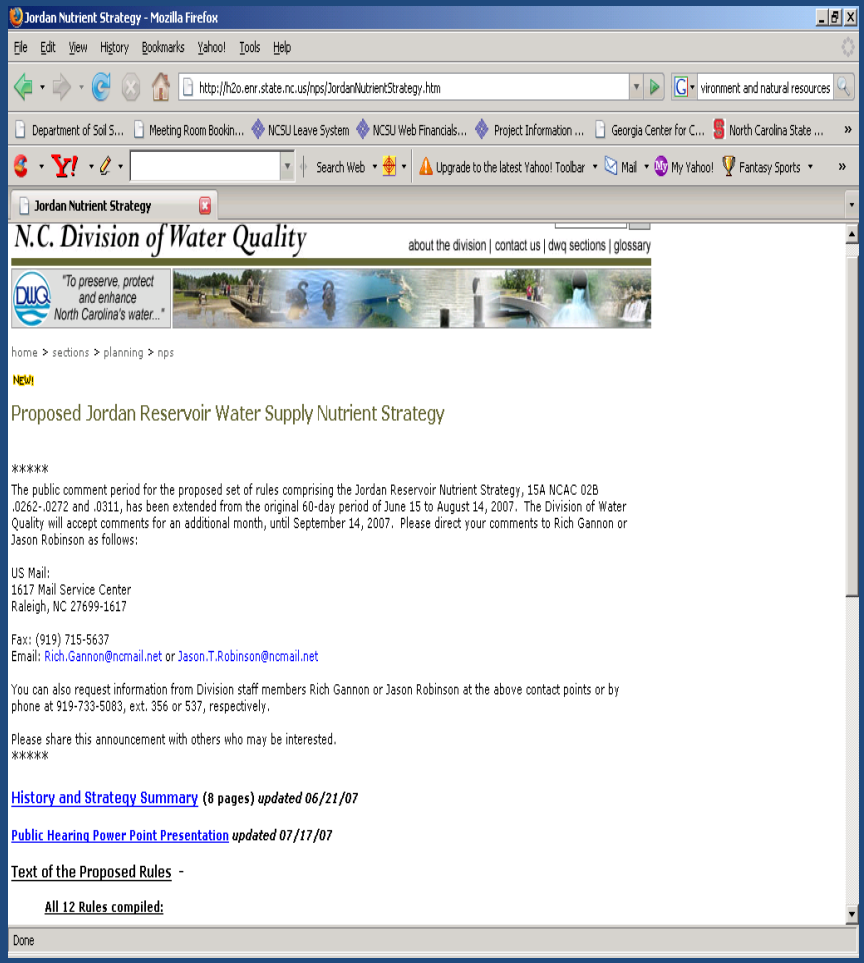
- Applies to all commercial agricultural producers (crop and horticulture) and livestock producers with the following number of animals:
  - 5 horses
  - 20 cattle
  - 20 swine (unconfined) or 150 swine (confined)
  - 650 turkey or 3,500 chickens
  - 120 sheep or 130 goats
  - 20,000 lbs of any combination of species

Jordan Lake Agriculture Rule: What Has to Happen?

- Nitrogen and phosphorus reduction goals have been established and must be met at the subwatershed level.
- County Soil and Water District Offices will calculate nutrient reductions due to conservation practices.

Jordan Lake Rules

- Old/New Development
- Waste Water Treatment Plants
- Nutrient Management
- Agriculture
- Buffer Protection



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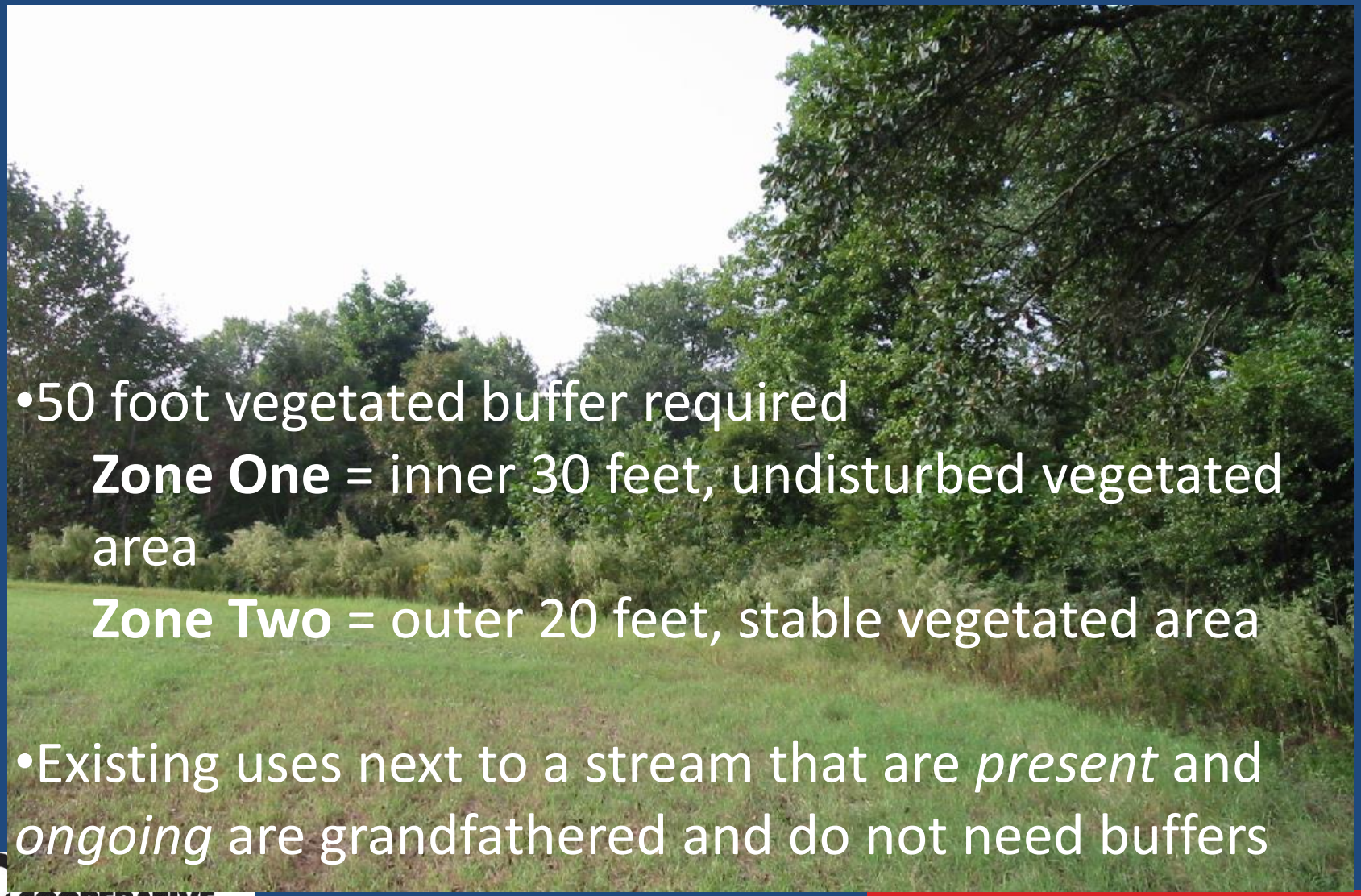
Jordan Riparian Buffer Rules



- 50 foot vegetated buffer required
  - **Zone One** = inner 30 feet, undisturbed vegetated area
  - **Zone Two** = outer 20 feet, stable vegetated area

- Existing uses next to a stream that are *present* and *ongoing* are grandfathered and do not need buffers

Where Does the Jordan Lake Buffer Rule Apply?

- The riparian buffer applies to the following types of surface waters:
  - Intermittent streams
  - Perennial streams
  - Modified natural streams
  - Lakes
  - Reservoirs
  - Ponds
- Contact your DWQ Regional Office to determine if a surface water is subject to the riparian buffer rules
  - http://portal.ncdenr.org/web/wq/home/ro

Next Chapter
Jordan Lake Nutrient Management

How Pollutants Move and
Conservation Practices

Jordan Lake Nutrient Management

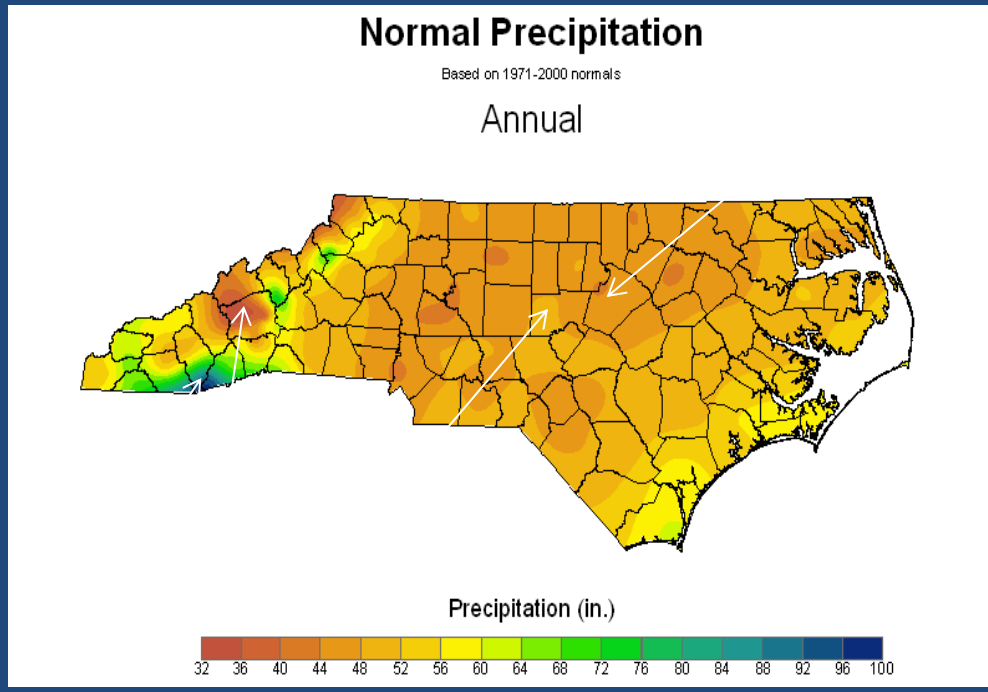
How Pollutants Move and Conservation Practices

Conservation Practices

- Pollutants are valuable resources when kept on the land
- Just as a weed is a ‘plant out of place’, soil, fertilizer, or nutrients only become pollutants when they move off-site
- Let’s review how to keep them on-site in row crops, pastures, and lawns…

North Carolina is Rainy!

- While water is necessary to grow crops, it also provides the transport mechanism for pollutants
- Rainfall in NC is variable and unpredictable!

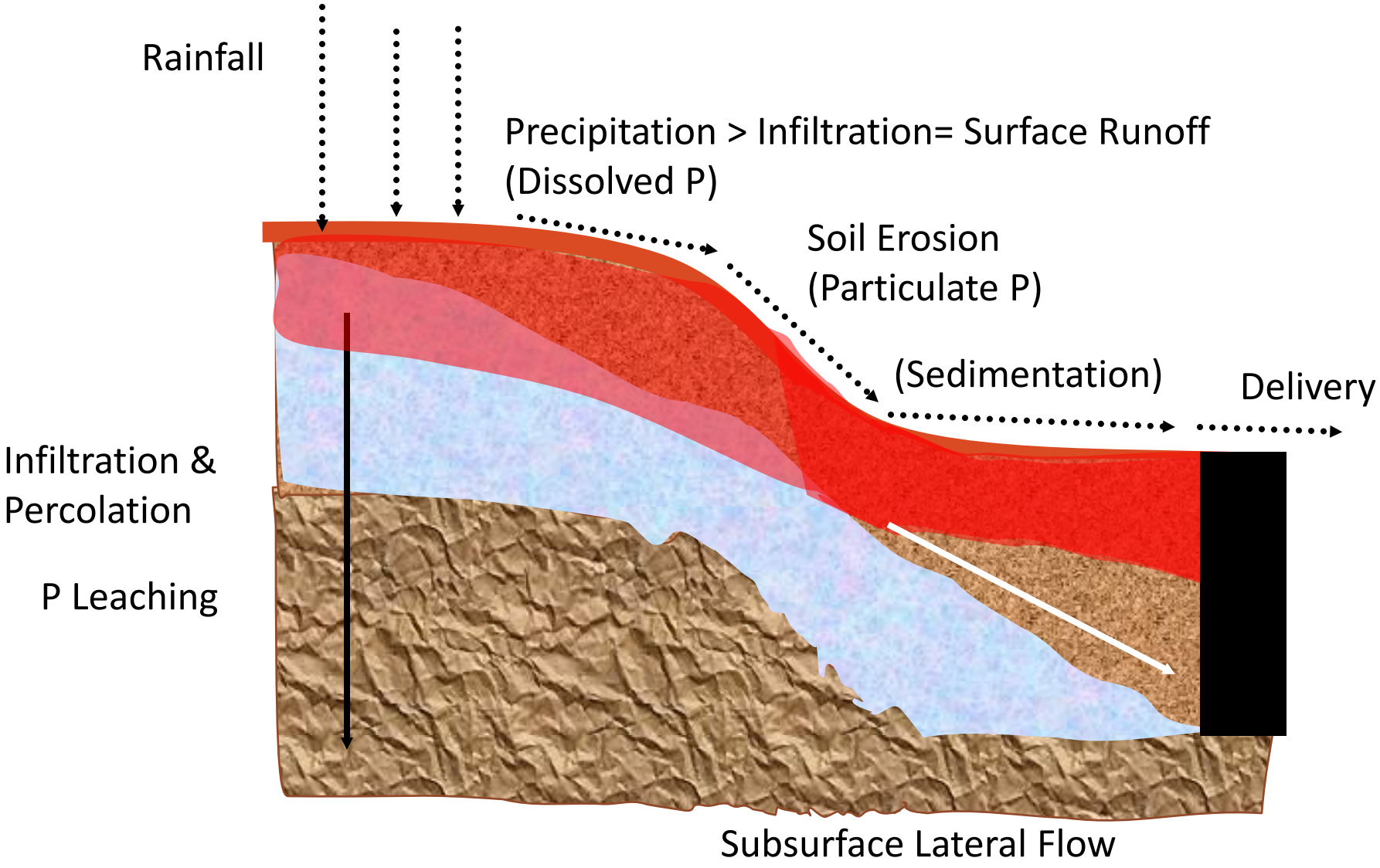


Erosion and Sedimentation

Sediment is the number 1 water pollutant in North Carolina and the United States….BUT

Nutrients are the major problem in Jordan Lake

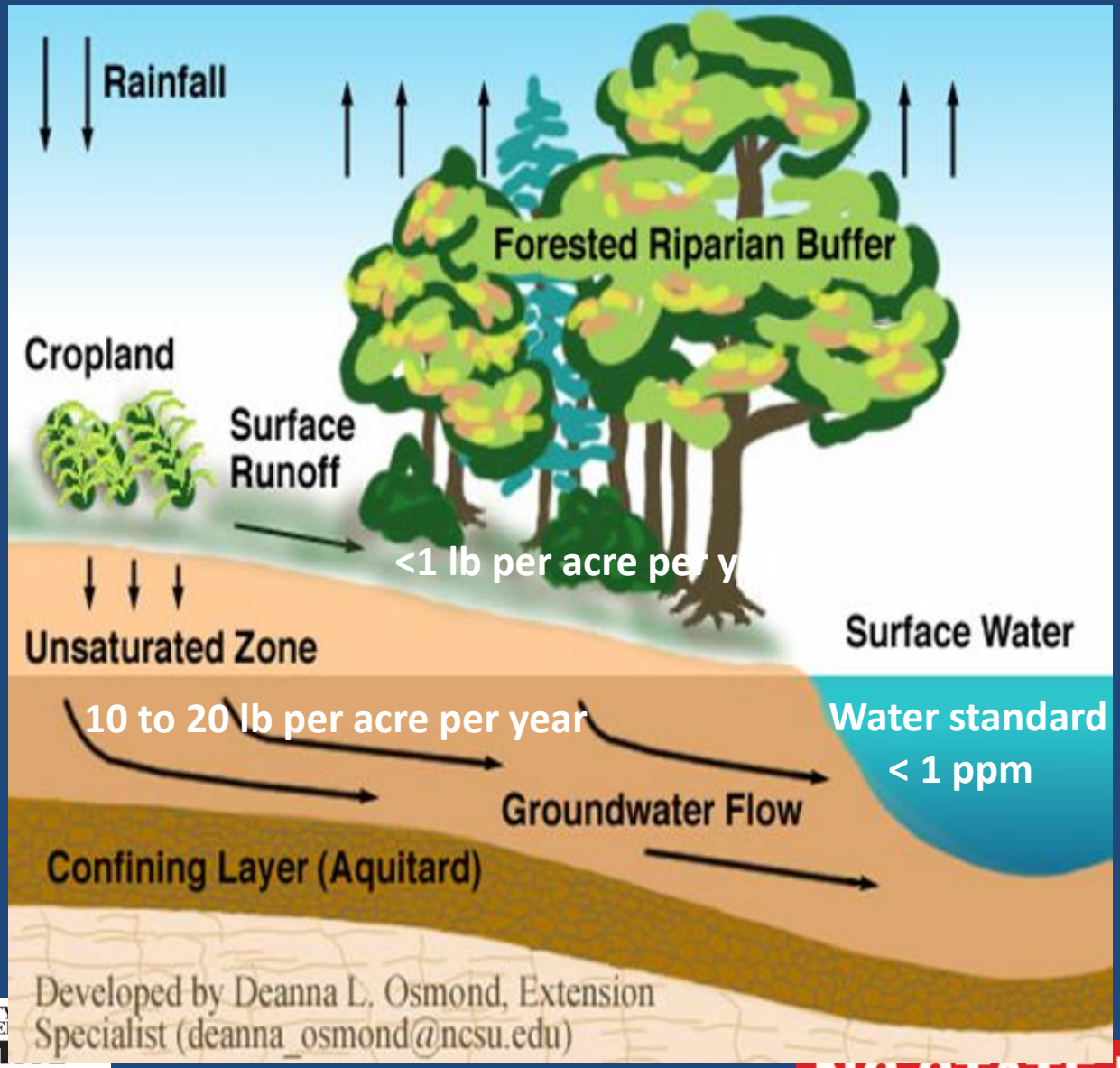
How Does P Move?



EPA Water Quality Criteria for Phosphorus

- 0.05 part per million (ppm)
  - stream that discharges into lake or reservoir
- 0.025 ppm
  - lake or reservoir
- 0.1 ppm
  - streams that do not discharge
- 0.01-0.03 ppm
  - to stop algal blooms

N Leaching Losses



Lawn Conservation Practices

- Nutrient management
- Grass management
- Stormwater management
- Stream restoration

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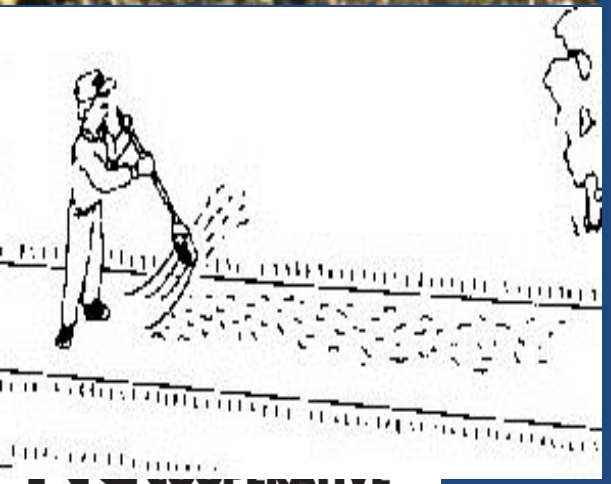

Nutrient Management: Good Housekeeping

- Avoid applying fertilizer to sidewalks and roadways
- Sweep or blow fertilizer onto lawn
- Remember, stormwater flows directly to creeks so any fertilizer on hard surfaces goes directly into streams

EXTENSION
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Grass Management: Avoid Scalping Grass

- Direct relationship between height of shoot and depth of roots
- Grass management provides cover and keeps the soil in place

Grass Management: Compacted Soils

- Rain water should infiltrate into turf, not run off
- Soil compaction limits turf growth and water infiltration
- When establishing a yard, deep rip the yard to reduce compaction
- Coring will not help with compaction

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Grass Management: Turf Selection

- NC is turf transition zone
- Cool season and/or warm season grasses possible depending on location
- Not all grasses are managed the same

Stormwater: Yard Conservation

Raingardens infiltrate runoff from roofs and driveways

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Backyard Stormwater Conservation

- Rain barrels collect roof runoff – reduces stormwater ‘footprint’
- Use water for irrigation or pressure washing

Stream Restoration

Natural Conservation Practices ???

Next Presentation
Jordan Lake Nutrient Management

How to Make Nutrient Decisions

Jordan Lake Nutrient Management

How to Make Nutrient Decisions

Why Do We Have Fertilizer Plans or Nutrient Management Plans?

- Provide nutrients for plant production
- Properly utilize manure or organic by-products as a plant nutrient source.
- Minimize loss of nutrients from agriculture and urban sources to surface and ground water.
- Improve or maintain the physical, chemical, and biological condition of the soil.

How Do We Know the Amount of Nutrient in the Soil Available for Plant Growth?

Soil Testing

Why Do We Soil Test?

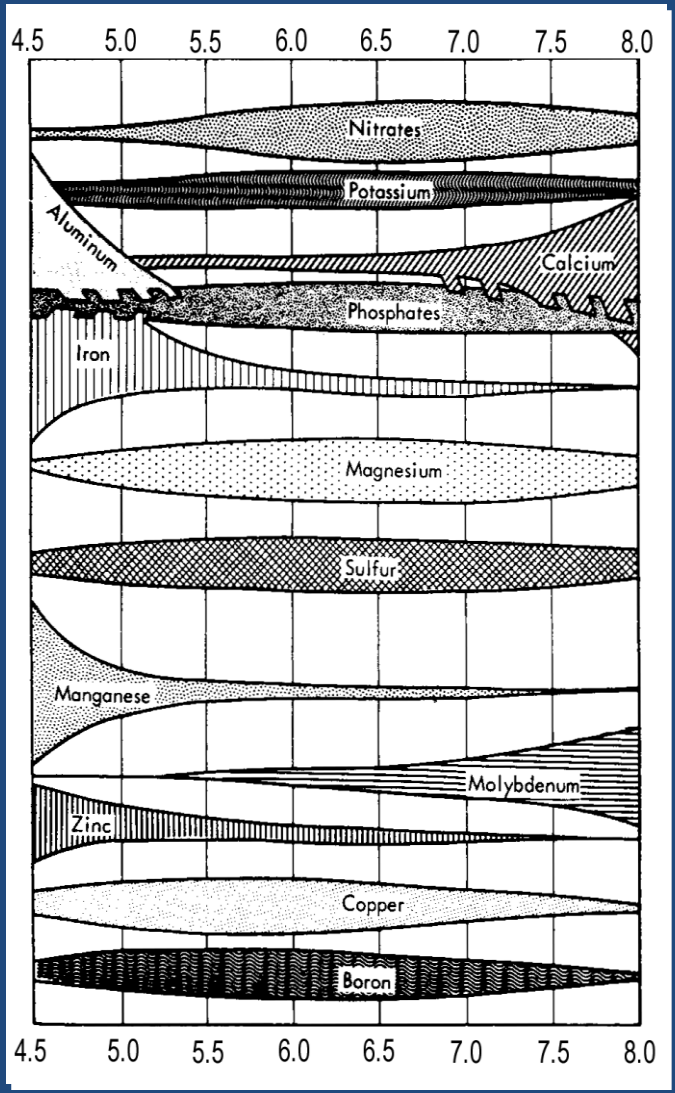
- Maintain high yields or aesthetic quality
- Reduce costs
  - Unnecessary fertilizers just increase costs
- Protect the environment
- Routine monitoring can spot nutrient problems before they become nutrient deficiencies or toxicities

What Does Soil Testing Measure?

- Does NOT measure the total nutrient concentration
- DOES measure the plant available nutrient concentration in a soil sample
- Estimates the ability of the soil to supply nutrients to a crop
- DOES measure pH and acidity for accurate lime recommendations

pH Measures Acidity

Crop	Optimum pH
Lawn	6.0
Centipede Grass	5.5
Corn	6.0
Soybeans	6.0
Pasture (Bermuda)	6.0

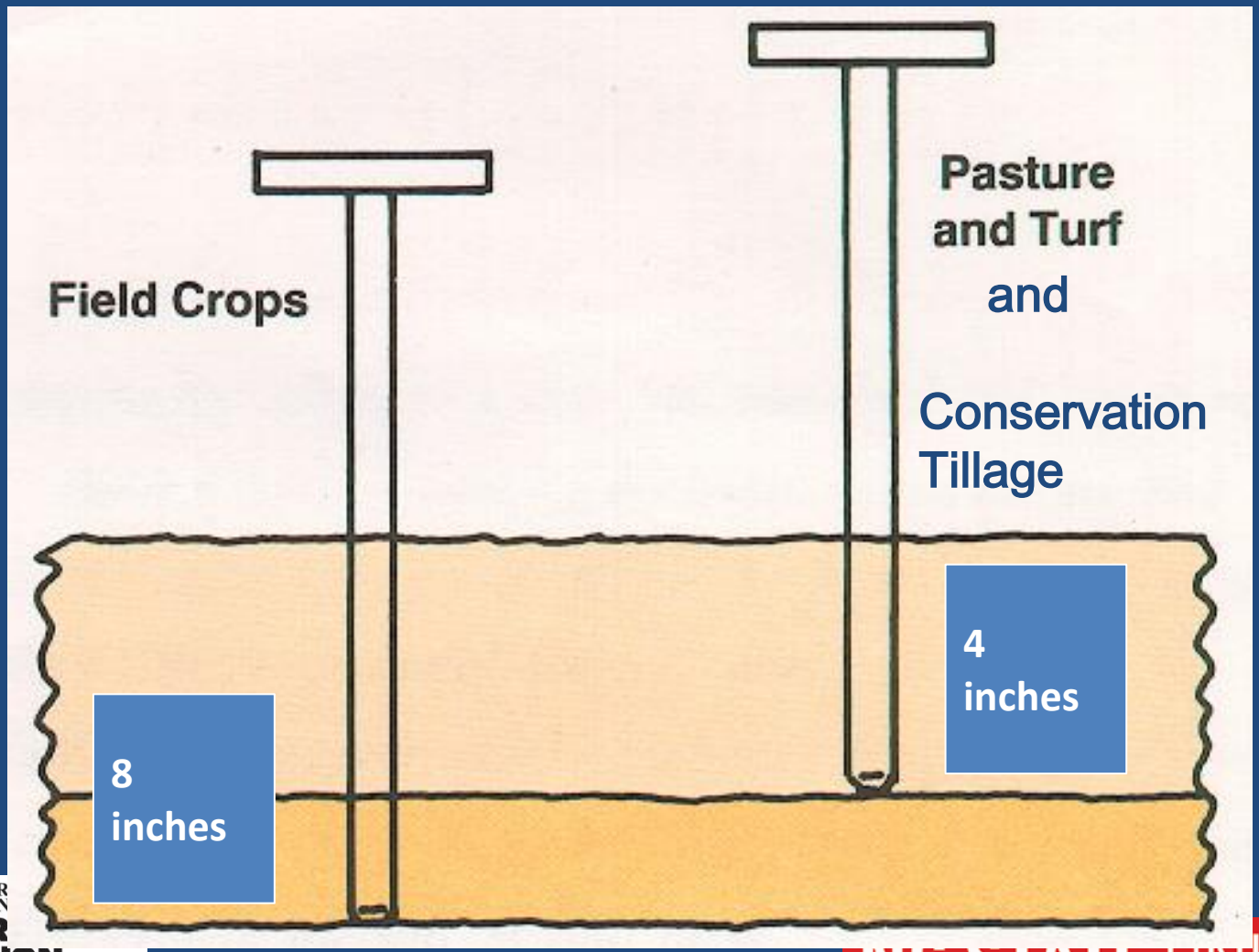


Soil Sampling Methods

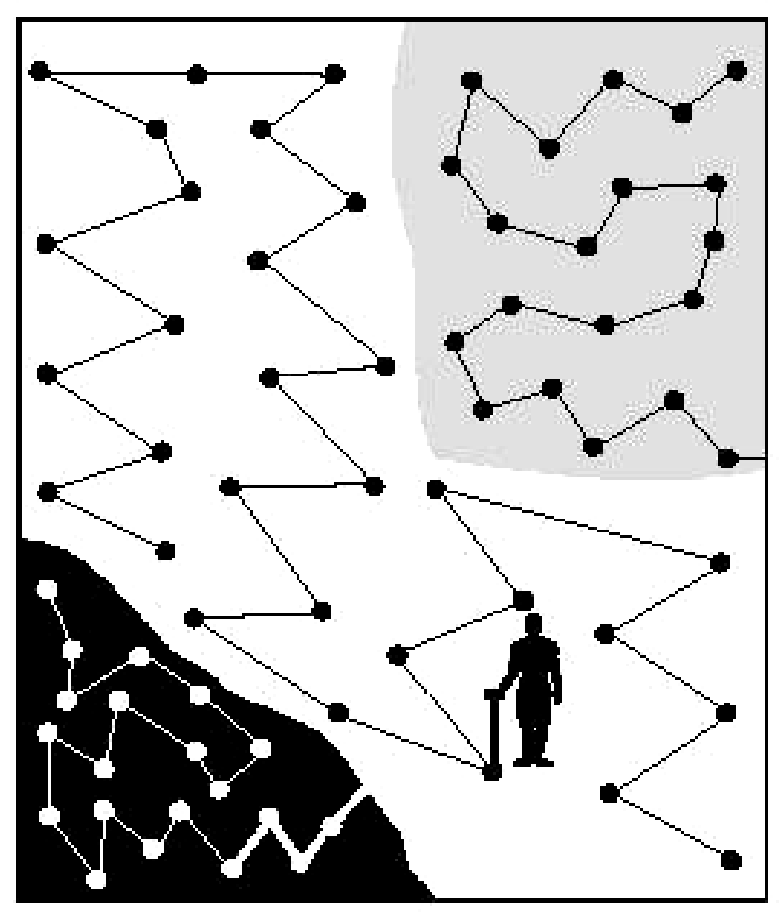
Importance of Collecting a Representative Soil Sample

- One acre of soil, 6” deep, weighs about 2,000,000 pounds
- Weight of soil in box about 1 pound
- Weight of sample analyzed is about 2.5 grams (1/10 of an ounce)

Soil Sampling Depth



Soil Sampling



- Collect 15 to 20 cores – no more than 10 acres
- Sample different soil types and landscape positions separately
- Soil sample based on NC Cooperative Extension recommendations

Soil Sample Handling

- Obtain sampling boxes from NC Cooperative Extension offices
- Mix cores well in clean plastic bucket
- Fill box to line
- Send sample in for analysis as soon as possible

Form AD-1 (March 2010)

SOIL SAMPLE INFORMATION

NCDA&CS Agronomic Division Soil Testing Section
Mailing Address: 1040 Mail Service Center, Raleigh NC 27699-1040
Physical Address (UPS/FedEx): 4300 Reedy Creek Road, Raleigh NC 27607
Phone: (919) 733-2655 Web Address: www.ncagr.gov/agronomi

FOR OFFICE USE ONLY
REPORT #

DATE REC'D
INITIAL

SAMPLE TYPE

Routine samples only — no fee

SAMPLE INFORMATION

FARM ID

SAMPLE DATE

COUNTY *(where collected)*

NUMBER OF SAMPLES

Reminders

Fill sample box to red line.

Select the proper crop code(s) from the list on the back of this form.

Pack samples securely for shipment.

GROWER INFORMATION ***(please print)***

LAST NAME FIRST NAME

ADDRESS

CITY STATE ZIP

PHONE ( ) -

E-MAIL ADDRESS ☐ **Do Not** notify me when report is available.

CONSULTANT/OTHER RECIPIENT

LAST NAME FIRST NAME

ADDRESS

CITY STATE ZIP

PHONE ( ) -

E-MAIL ADDRESS ☐ **Do Not** notify me when report is available.

LAB NUMBER (Leave blank)	SAMPLE IDENTIFICATION	LIME APPLIED WITHIN PAST 12 MONTHS Tons/Acre	Month	Year	You must specify a crop CODE to receive a recommendation (see reverse side of form) FIRST CROP	CODE	SECOND CROP	CODE
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

Thank you for using agronomic services to manage nutrients and safeguard environmental quality. — Steve Troxler, Commissioner of Agriculture

Taking a Soil Sample

A soil test is only as good as the soil sample!

Use iron or stainless steel tools. Sample dry soil in areas of 10 acres or fewer. Avoid combining soils of different types and/or treatment histories. Avoid fertilizer bands and corners or end-turn areas. For each sample, collect 20 or more cores at the appropriate depth (0–8" for plowed soils; 0–4" for no-till, sod & lawns). Mix cores in a plastic bucket, then fill the sample box.
DO NOT PUT SOIL IN PLASTIC BAGS.

Filling out the Sample Information Form

EXAMPLE

LAB NUMBER (Leave blank)	SAMPLE IDENTIFICATION	LIME APPLIED WITHIN PAST 12 MONTHS Tons/Acre	Month	Year	FIRST CROP	CODE	SECOND CROP	CODE
1	J 1	1	9	2002	Corn	001	Small Grain	004
2	S 1	2	9	2002	Clover / Grass, M	050	Clover / Grass, M	050
3	S 2	0			Bermuda Hay, E	043	Bermuda Hay, M	044

REQUIRED INFORMATION
The lab **MUST** have this information.

SAMPLE & GROWER INFORMATION — Provide as much information as possible. Print neatly.
CONSULTANT/OTHER RECIPIENT — List name & contact information for anyone else who needs to know about the report.
SAMPLE IDENTIFICATION — Print an identifier (use numbers and/or letters) for each sample on a separate line. The identifier should help remind you where the sample came from (Example: J1, S1). Make sure the sample identifers on the boxes and on the information form are the same. **Use pencil or waterproof markers.**
FIRST CROP — List the crop for which you want lime and fertilizer recommendations. Be sure to include the appropriate **CODE** from the list below (*e.g.*, Bermuda hay or pasture establishment, 043).
A. Use **Lawn** (code 026) for all lawn grasses except **Centipede**. Use one of the **Fine Turf** codes only for golf and athletic field turf.
B. Use **Shrubbery** (code 029) for all shrubs, except azalea, camellia, rhododendron and mountain laurel.
C. For all home garden vegetables, use code 024.

DESIRABLE INFORMATION
The lab can make better suggestions if this information is provided.

LIME APPLIED WITHIN PAST 12 MONTHS — Provide the amount of lime applied in tons/acre, as well as the year and month of the last application, if made during the past 12 months. (50M is equivalent to one ton per acre.)
SECOND CROP — List the name of the crop that will follow the one listed as **FIRST CROP**. Include its **CODE** from the list below. This will enable us to make suggestions for this crop, assuming that the field is treated as suggested the first year. List the second crop even if it will be grown the same year as **FIRST CROP**.

CROP CODES

E = establishment (1st year)
M = maintenance
SG = small grain

000 No Crop

Field Crops
001 Corn, grain
002 Corn, silage
003 Cotton
004 Small Grain
006 Milo (Grain Sorghum)
007 Peanut
010 Soybean
011 Sunflower
012 Tobacco, burley
013 Tobacco, flue-cured
014 Tobacco, greenhouse
015 SG silage/ Soybean
016 SG silage/ Corn silage
017 Kenaf
018 SG/ Soybean (double crop)

Home Lawn & Garden
020 Azalea
021 Camellia
022 Centipede
023 Flower garden
024 Vegetable garden
025 Mountain laurel
026 Lawn
027 Rhododendron
028 Rose
029 Shrubbery
030 Berries/ Fruit/ Nuts
031 Tree, shade

Christmas Trees
034 Leyland cypress
035 Line-out/ Seed Beds
036 Fir/ N Spruce/ Hemlock, E
037 Fir/ N Spruce/ Hemlock, M
038 Pine, White or Virginia
039 Blue Spruce/ Red Cedar

Forage & Pasture
040 Alfalfa, E
041 Alfalfa, M
042 Common bermuda/ Bahia

Forage & Pasture (cont.)
043 Bermuda hay/ pasture, E
044 Bermuda hay/ pasture, M
047 Bluegrass pasture
048 Bluegrass/ White Clover
049 Clover/ Grass, E
050 Clover/ Grass, M
051 Gamagrass
053 Legumes, misc.
054 Fescue/ Orchard/ Timothy, E
055 Fescue/ Orchard/ Timothy, M
056 Prairiegrass
057 Switchgrass
059 Sudan/Sorghum/Millet/Red Crabgrass
060 Sudan/ Sorghum silage

Roadside Areas
061 Critical area
062 Roadside grass, E
063 Roadside grass, M

Wildlife Areas / Food Plots
066 Deer / Turkey
067 Upland game
068 Waterfowl
069 Fish pond

Commercial Hort Crops ONLY
[024 = all Home Vegetables]
070 Asparagus, E
071 Asparagus, M
072 Beans/ Peas
074 Beet
072 Beans/ Peas
074 Beet
075 Blueberry, E
076 Blueberry, M
077 Broccoli/ B. sprouts/Cauliflower
079 Cabbage
080 Cantaloupe/ Watermelon
084 Corn, sweet
085 Cucumber
088 Grape, E
089 Grape, M
090 Kale/ Mustard/ Spinach
093 Okra
095 Pea, southern
096 Pepper
097 Plant bed, vegetable
098 Potato, Irish
099 Sweetpotato

Commercial Hort Crops (cont.)
100 Radish
101 Rape/ Canola
102 Raspberry/ Blackberry, E
103 Raspberry/ Blackberry, M
107 Squash/ Pumpkin
108 Strawberry, E
109 Strawberry, M
110 Tomato
111 Tomato, greenhouse
115 Turnip
116 Vegetables, other

Commercial Nursery & Flowers
120 Dahlia
121 Gladiolus
122 Greenhouse
123 Gysophila (Baby's Breath)
124 Flower, bulbs
125 Flower, roots
126 Nursery, container
132 Rhododendron/ Ginseng/ Native ornamentals
136 Nursery/ Trees

Orchard, Fruit & Nut
130 Apple, E
131 Apple, M
138 Peach, E
139 Peach, M
140 Pecan, E
141 Pecan, M

Forest Trees & Seed
133 Hardwood, E
134 Hardwood, M
137 Nursery, pine
142 Pine, E
143 Pine, M
144 Hardwood, seed
145 Fir/ Spruce, seed
146 Pine, seed

Fine Turf
150 Fairway/ Athletic turf
151 Tee
152 Greens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SOIL TESTING SECTION
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RALEIGH NC 27607-6465
NCDA&CS Agronomic Division, 4300 Reedy Creek Rd., Raleigh, NC 27607-6465; (919) 733-2655
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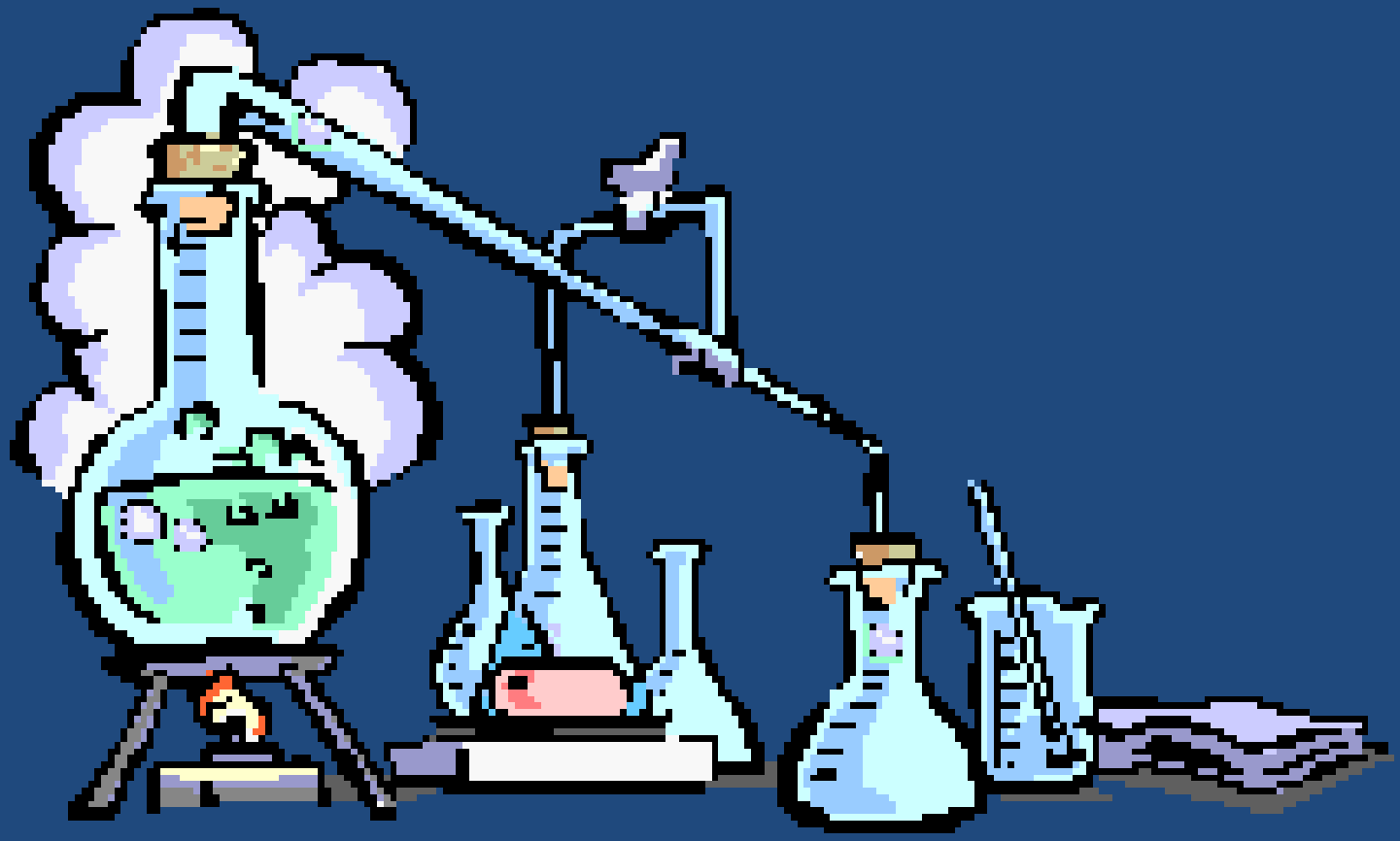
Soil Analysis Basics



Soil Testing Extractant

- NCDA&CS Uses the Mehlich-3 Extractant
- If you use a commercial lab for your soil testing, that lab must use Mehlich-3 Extractant AND the fertilizer recommendations must match NCDA&CS to meet legal requirements in the Jordan Lake River Basin

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How to Read Your Soil Reports

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Lawn Soil Tests

NCDA&CS Agronomic Division **Phone: (919)733-2655** **Web Site:** **Report No:**

Growe *Copies*

5

Soil Test

3/15/2010 SERVING N.C. RESIDENTS FOR **Alamance County**

Agronomist B -- 4

Field		Applied		Recommendati												
Sample	*Last*	*Mo*	*Yr*	*Crop or Year*	*Lime*	*N*	*P_2O_5*	*K_2O*	*Mg*	*S*	*Cu*	*Zn*	*B*	*Mn*	*See Note*	
FRONT				1st Lawn	120M	(7.0 lbs 15-0-14 or EQUIV	PER 1000 SQ		0				.0		4	
				2nd					0				0			

Test Results

Soil	*HM%*	*W/V*	*CEC*	*BS%*	*Ac*	*pH*	*P-I*	*K-I*	*Ca%*	*Mg%*	*Mn-I*	*Mn-Al(1*	*Mn-Al(2*	*Zn-I*	*Zn-Al*	*Cu-I*	*S-I*	*SS-I*	*NO_3-*	*NH_4-*	*Na*
MIN	0.60	1.32	6.4	47.0	3.4	4.2	287	28	32.0	12.0	112			88	88	133	71				0.1

Field		Applied		Recommendati												
Sample	*Last*	*Mo*	*Yr*	*Crop or Year*	*Lime*	*N*	*P_2O_5*	*K_2O*	*Mg*	*S*	*Cu*	*Zn*	*B*	*Mn*	*See Note*	
BACK				1st Lawn	115M	(1.0 lbs Nitrogen or EQUIV	PER 1000 SQ		0				.0		4	
				2nd					0				.0			

Test Results

Soil	*HM%*	*W/V*	*CEC*	*BS%*	*Ac*	*pH*	*P-I*	*K-I*	*Ca%*	*Mg%*	*Mn-I*	*Mn-Al(1*	*Mn-Al(2*	*Zn-I*	*Zn-Al*	*Cu-I*	*S-I*	*SS-I*	*NO_3-*	*NH_4-*	*Na*
MIN	0.60	0.96	9.7	65.0	3.4	4.4	372	57	43.0	19.0	116			265	265	113	86				0.1

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Lawn Lime Recommendations

NCDA&CS Agronomic Division **Phone: (919)733-2655** **Web Site:** **Report No:**

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Soil Test

3/15/2010 SERVING N.C. RESIDENTS FOR **Alamance County**

Agronomist B -- 4

Field		Applied		Recommendati												
Sample	*Last*	*Mo*	*Yr*	*Crop or Year*		*Lime*	*N*	*P_2O_5*	*K_2O*	*Mg*	*S*	*Cu*	*Zn*	*B*	*Mn*	*See Note*
FRONT				1st	Lawn	120M	(7.0 lbs 15-0-14 or EQUIV		PER 1000 SQ	0				.0		4
				2nd							0			.0		

Test Results

Soil	*HM%*	*W/V*	*CEC*	*BS%*	*Ac*	*pH*	*P-I*	*K-I*	*Ca%*	*Mg%*	*Mn-I*	*Mn-Al(1*	*Mn-Al(2*	*Zn-I*	*Zn-Al*	*Cu-I*	*S-I*	*SS-I*	*NO_3-*	*NH_4-*	*Na*
MIN	0.60	1.32	6.4	47.0	3.4	4.2	287	28	32.0	12.0	112			88	88	133	71				0.1

Field		Applied		Recommendati												
Sample	*Last*	*Mo*	*Yr*	*Crop or Year*		*Lime*	*N*	*P_2O_5*	*K_2O*	*Mg*	*S*	*Cu*	*Zn*	*B*	*Mn*	*See Note*
BACK				1st	Lawn	115M	(1.0 lbs Nitrogen or EQUIV		PER 1000 SQ	0				.0		4
				2nd							0			.0		

Test Results

Soil	*HM%*	*W/V*	*CEC*	*BS%*	*Ac*	*pH*	*P-I*	*K-I*	*Ca%*	*Mg%*	*Mn-I*	*Mn-Al(1*	*Mn-Al(2*	*Zn-I*	*Zn-Al*	*Cu-I*	*S-I*	*SS-I*	*NO_3-*	*NH_4-*	*Na*
MIN	0.60	0.96	9.7	65.0	3.4	4.4	372	57	43.0	19.0	116			265	265	113	86				0.1

Other Fertilizer Recommendations

Nutrients

- Phosphorus (P)
- Potassium (K)
- Sulfur (S)
- Manganese (Mn)
- Copper (Cu)
- Zinc (Zn)

Fertilizer Rates

- Determined based on yield response to fertilizer
- Strategy is to fertilize the crop, not the soil
- Fertilizer recommendations are in pounds per thousand square feet for turf

Lawn Phosphorus Recommendations

NCDA&CS Agronomic Division **Phone: (919)733-2655** **Web Site:** **Report No:**

Growe *Copies*

Soil Test

3/15/2010 SERVING N.C. RESIDENTS FOR **Alamance County**

Agronomist B -- 4

Field		**Applied**		**Recommendati**													
Sample	***Last***	***Mo***	***Yr***	***Crop or Year***		***Lime***	***N***	***P_2O_5***	***K_2O***	***Mg***	***S***	***Cu***	***Zn***	***B***	***Mn***	***See Note***	
FRONT				1st	Lawn	120M	(7.0 lbs 15-0-14 or EQUIV	PER	1000 SQ	0				.0		4	
				2nd							0			.0			

Test Results

Soil	***HM%***	***W/V***	***CEC***	***BS%***	***Ac***	***pH***	***P-I***	***K-I***	***Ca%***	***Mg%***	***Mn-I***	***Mn-Al(1***	***Mn-Al(2***	***Zn-I***	***Zn-Al***	***Cu-I***	***S-I***	***SS-I***	***NO_3-***	***NH_4-***	***Na***
MIN	0.60	1.32	6.4	47.0	3.4	4.2	287	28	32.0	12.0	112			88	88	133	71				0.1

Field		**Applied**		**Recommendati**													
Sample	***Last***	***Mo***	***Yr***	***Crop or Year***		***Lime***	***N***	***P_2O_5***	***K_2O***	***Mg***	***S***	***Cu***	***Zn***	***B***	***Mn***	***See Note***	
BACK				1st	Lawn	115M	(1.0 lbs Nitrogen or EQUIV	PER	1000 SQ	0				.0		4	
				2nd							0			.0			

Test Results

Soil	***HM%***	***W/V***	***CEC***	***BS%***	***Ac***	***pH***	***P-I***	***K-I***	***Ca%***	***Mg%***	***Mn-I***	***Mn-Al(1***	***Mn-Al(2***	***Zn-I***	***Zn-Al***	***Cu-I***	***S-I***	***SS-I***	***NO_3-***	***NH_4-***	***Na***
MIN	0.60	0.96	9.7	65.0	3.4	4.4	372	57	43.0	19.0	116			265	265	113	86				0.1

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NCDA Index System

- Unique to North Carolina
- Used for phosphorus (P), potassium (K), manganese (Mn), zinc (Zn), copper (Cu), sulfur (S)
- Converts nutrients to common index value

Index Value	Index Rating	Fertilizer Response
0-25	Low	High
26-50	Medium	Medium
51-100	High	Low
>100	Very High	None

Lawn Phosphorus Recommendations

NCDA&CS Agronomic Division **Phone: (919)733-2655** **Web Site:** **Report No:**

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Soil Test

3/15/2010 SERVING N.C. RESIDENTS FOR **Alamance County**

Agronomist B -- 4

Field		**Applied**		**Recommendati**														
Sample	***Last***	***Mo***	***Yr***	***Crop or Year***	***Lime***	***N***	***P_2O_5***	***K_2O***	***Mg***	***S***	***Cu***	***Zn***	***B***	***Mn***	***See Note***			
FRONT				1st Lawn	120M	(7.0 lbs 15-0-14 or EQUIV		PER 1000 SQ	0				.0		4			
				2nd					0				.0					

Test Results

Soil	***HM%***	***W/V***	***CEC***	***BS%***	***Ac***	***pH***	***P-I***	***K-I***	***Ca%***	***Mg%***	***Mn-I***	***Mn-Al(1***	***Mn-Al(2***	***Zn-I***	***Zn-Al***	***Cu-I***	***S-I***	***SS-I***	***NO_3-***	***NH_4-***	***Na***
MIN	0.60	1.32	6.4	47.0	3.4	4.2	287	28	32.0	12.0	112			88	88	133	71				0.1

Field		**Applied**		**Recommendati**														
Sample	***Last***	***Mo***	***Yr***	***Crop or Year***	***Lime***	***N***	***P_2O_5***	***K_2O***	***Mg***	***S***	***Cu***	***Zn***	***B***	***Mn***	***See Note***			
BACK				1st Lawn	115M	(1.0 lbs Nitrogen or EQUIV		PER 1000 SQ	0				.0		4			
				2nd					0				.0					

Test Results

Soil	***HM%***	***W/V***	***CEC***	***BS%***	***Ac***	***pH***	***P-I***	***K-I***	***Ca%***	***Mg%***	***Mn-I***	***Mn-Al(1***	***Mn-Al(2***	***Zn-I***	***Zn-Al***	***Cu-I***	***S-I***	***SS-I***	***NO_3-***	***NH_4-***	***Na***
MIN	0.60	0.96	9.7	65.0	3.4	4.4	372	57	43.0	19.0	116			265	265	113	86				0.1

NC STATE UNIVERSITY A&T STATE UNIVERSITY COOPERATIVE EXTENSION *Helping People Put Knowledge to Work*

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Zinc and Copper Can Be Toxic

NCDA&CS Agronomic Division **Phone: (919)733-2655** **Web Site:** **Report No:**

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Soil Test

9/9/2010 SERVING N.C. RESIDENTS FOR Far **Orange County**

Agronomist

A -- 3, $

ATTENTION: This report was flagged with a "C" and/or "Z" to alert you that copper and/or zinc have accumulated in the soil and are approaching a level that could be detrimental to crop production. The C and Z symbols are printed on your report for soil test index levels of 2000 or more; for peanuts with zinc, the level is 300. This note is designed to be a "trigger" that allows enough time to either reduce the rate of application or find another field for application of biosolids and/or waste water. The CTL (critical toxic level) for Cu & Zn has been set at 3000 index; for peanuts with zinc, the level is 500. These levels are used by DENR as a benchmark to determine when application of waste products should be stopped. The CTL for copper and zinc was set to prevent levels from accumulating to the point where they become toxic to crops grown on a field.

David H. Hardy, Agronomist
March 23, 2010

Field		Applied		Recommendati												
Sample	Last	Mo	Yr	Crop or Year		Lime	N	P_2O_5	K_2O	Mg	S	Cu	Zn	B	Mn	See Note
ADD1				1st	Corn Grain	0	120-160	50-70	80-100	0	15-20	0	0	.0	0	3
				2nd	Soybeans	0	0	50-70	80-100	0	15-20	0	0		0	3

Test Results

Soil	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-Al(1	Mn-Al(2	Zn-I	Zn-Al	Cu-I	S-I	SS-I	NO_3-	NH_4-	Na
MIN	0.32	0.89	7.9	89.0	0.9	6.3	33	25	63.0	24.0	73	56	49	129	129	200	25				0.1

Field		Applied		Recommendati												
Sample	Last	Mo	Yr	Crop or Year		Lime	N	P_2O_5	K_2O	Mg	S	Cu	Zn	B	Mn	See Note
ADD2				1st	Corn Grain	0	120-160	20-40	60-80	0	0	0	0	.0	0	3
				2nd	Soybeans	0	0	20-40	60-80	0	0	0	0		0	3

Test Results

Soil	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-Al(1	Mn-Al(2	Zn-I	Zn-Al	Cu-I	S-I	SS-I	NO_3-	NH_4-	Na
MIN	0.27	0.91	8.8	90.0	0.9	6.1	46	34	62.0	26.0	86	67	60	131	131	133	31				0.1

Turf Nutrient Management

- Is turf a crop?
- Is turf a significant crop in the Jordan Lake watershed?
- Is turf expanding?
- How many native turf grasses do we grow?
- Does turf require special management?

Turf Selection

- NC is turf transition zone
- Cool season and/or warm season grasses possible depending on location
- Most grass in Jordan Lake River Basin is fescue

Soil Test to Determine Fertilizer Amounts for Phosphorus, Potassium, and Lime

NCDA&CS Agronomic Division Phone: (919)733-2655 Web site: www.ncagr.gov/agronomi/ Report No: 21996

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Soil Test Report

Farm:

01/14/2009 SERVING N.C. RESIDENTS FOR OVER 60 YEARS Wake County

Agronomist Comments 4

Field Information		Applied Lime			Recommendations											
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year	Lime	N	P_2O_5	K_2O	Mg	S	Cu	Zn	B	Mn	See Note
LORD1					1st Crop: Lawn	0	(1.0 lbs Nitrogen or EQUIV PER 1000 SQ FT)				0			.0		4
					2nd Crop:						0			.0		

Test Results

Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-Al(1)	Mn-Al(2)	Zn-I	Zn-Al	Cu-I	S-I	SS-I	NO_3-N	NH_4-N	Na
MIN	0.60	0.90	10.5	86.0	1.5	5.9	65	115	64.0	17.0	201			178	178	72	49				0.2

Does this lawn need Phosphorus? Potassium? Lime?

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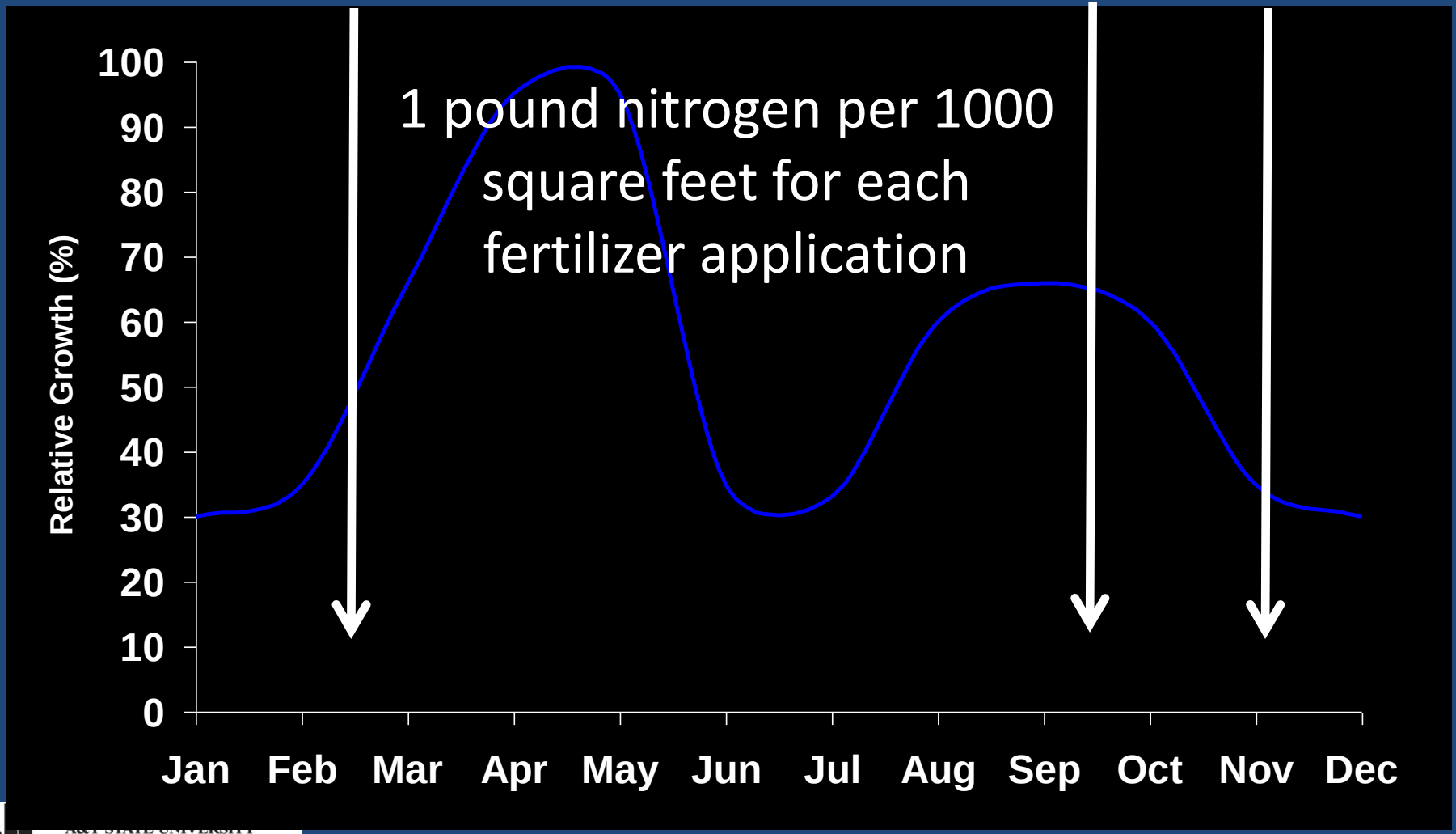
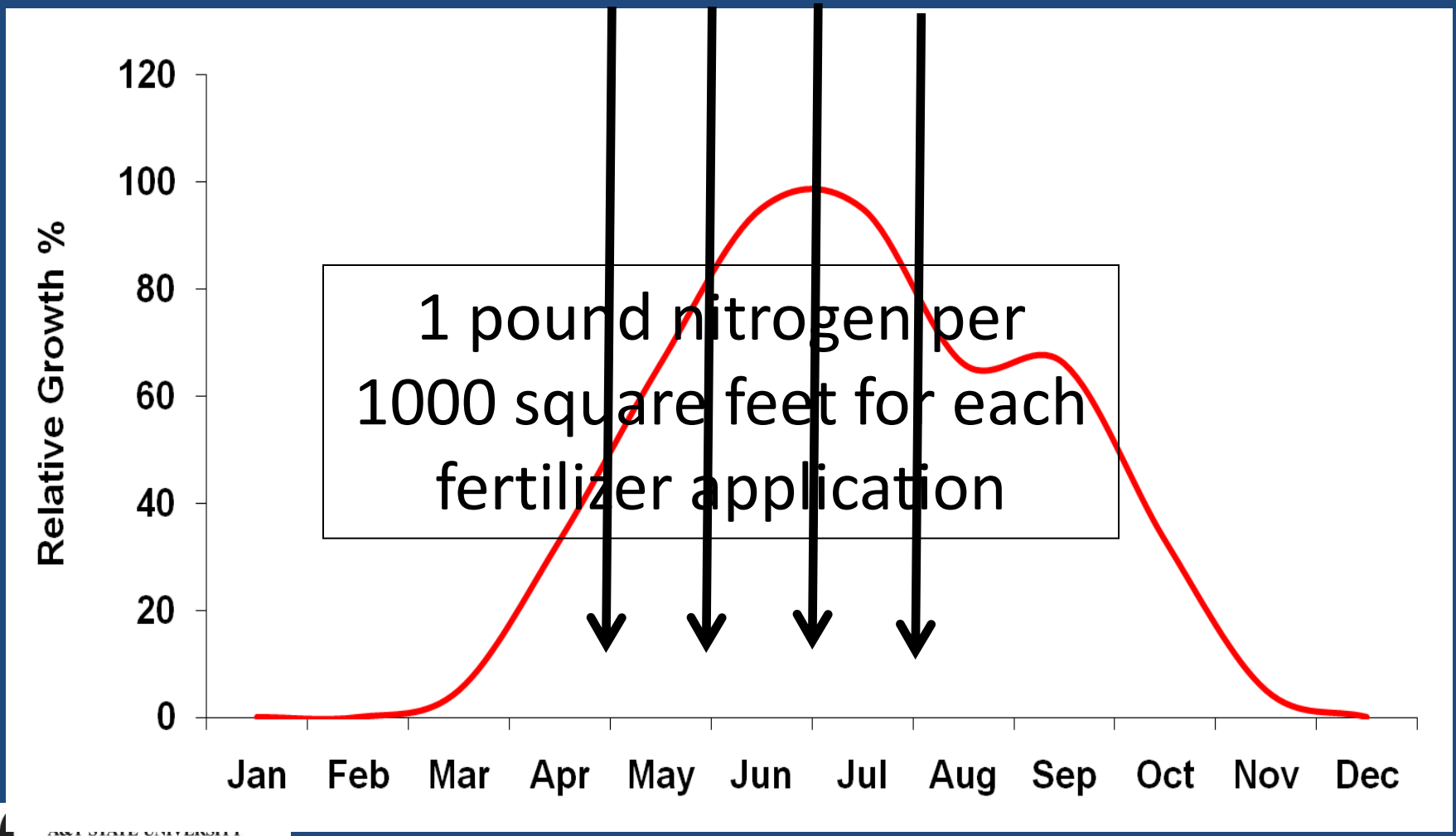
Nitrogen Fertilizer Rate and Timing: Fescue



Nitrogen Fertilizer Rate and Timing: Bermuda grass



Fertilizer Types

- Grades: N, P2O5, K2O (23-3-3)
- Homogeneous granular (ammoniated)
  - Premixed grades (27-3-3)
  - Uniform (10-10-10)
- Bulk Blend
  - Physical blend of basic materials: NH_4NO_3, DAP, KCl others

Nitrogen Fertilizer Sources Physical Form and Analysis

Source	% N	Form
Anhydrous	82	Pressurized Gas
Urea	46	Granular
Ammonium nitrate	34	Granular
UAN (urea-ammonium nitrate)	28-32	Liquid
Ammonium sulfate	21	Granular
Sodium nitrate	16	Granular

Phosphorus Fertilizer Sources Physical Form and Analysis

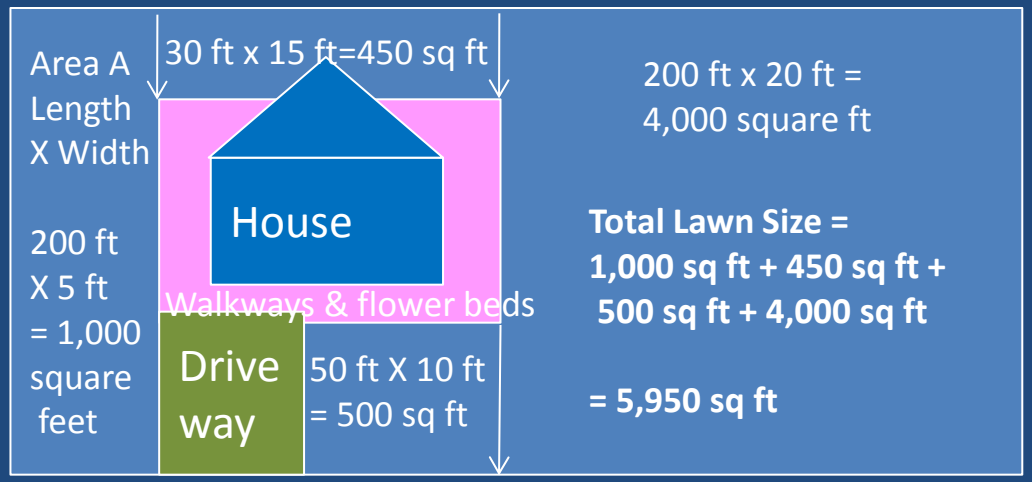
Source	% P_2O_5	Form
Normal super phosphate	16-22 (11-12S)	Gran.
Triple super phosphate	44-53	Gran.
Monoammonium phosphate (MAP)	48-62 (11-13 N)	Gran.
Diammonium phosphate (DAP)	46-53 (18-21 N)	Gran.
Ammonium polyphos-phate (APP)	35-62 (10-15 N)	Liq.

Potassium Fertilizer Sources Physical Form and Analysis

Source	% K_2O	Form
Potassium chloride	60	Gran.
Potassium sulfate	50 (17)	Gran.
Potassium nitrate	(13) 44	Gran.
Potassium magnesium sulfate	22 (22,11)	Gran.

Calculate Granular Fertilizer for Turf

- Need 1 lb nitrogen per 1,000 square feet
- Measure the number of square feet in your lawn.



Calculate Granular Fertilizer for Turf

- Calculate your lawn area in 1,000 square feet
  - 5,950 square feet of lawn/1,000 square feet lawn for your recommendation) = 5.95
  - 5.95 * 1 lb nitrogen per 1,000 square feet =

  5.95 lb nitrogen/1,000 square feet needed
- What fertilizer will you use based on total nutrient needs?
  - 22-0-11 is available (0.22 lb N per lb of fertilizer)
- How much fertilizer do you need to apply if you are using 22-0-11?

$$\frac{\text{5.95 lb of nitrogen}}{\text{0.22 lb nitrogen per 1 lb fertilizer}}$$

= 27 lb of 22-0-11 fertilizer for the lawn

For Help On Nutrient Management, Call Your County Cooperative Extension Office

- Alamance (336) 570-6740
- Caswell (336) 694-4158
- Chatham (919) 542-8202
- Durham (919) 560-0525
- Guilford (336) 375-5876
- Orange (919) 245-2050
- Rockingham (336) 342-8230
- Wake (919) 250-1100

http://www.ces.ncsu.edu/index.php?page=countycenters

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