Nutrient Management in North Carolina

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Animal Agriculture in North Carolina

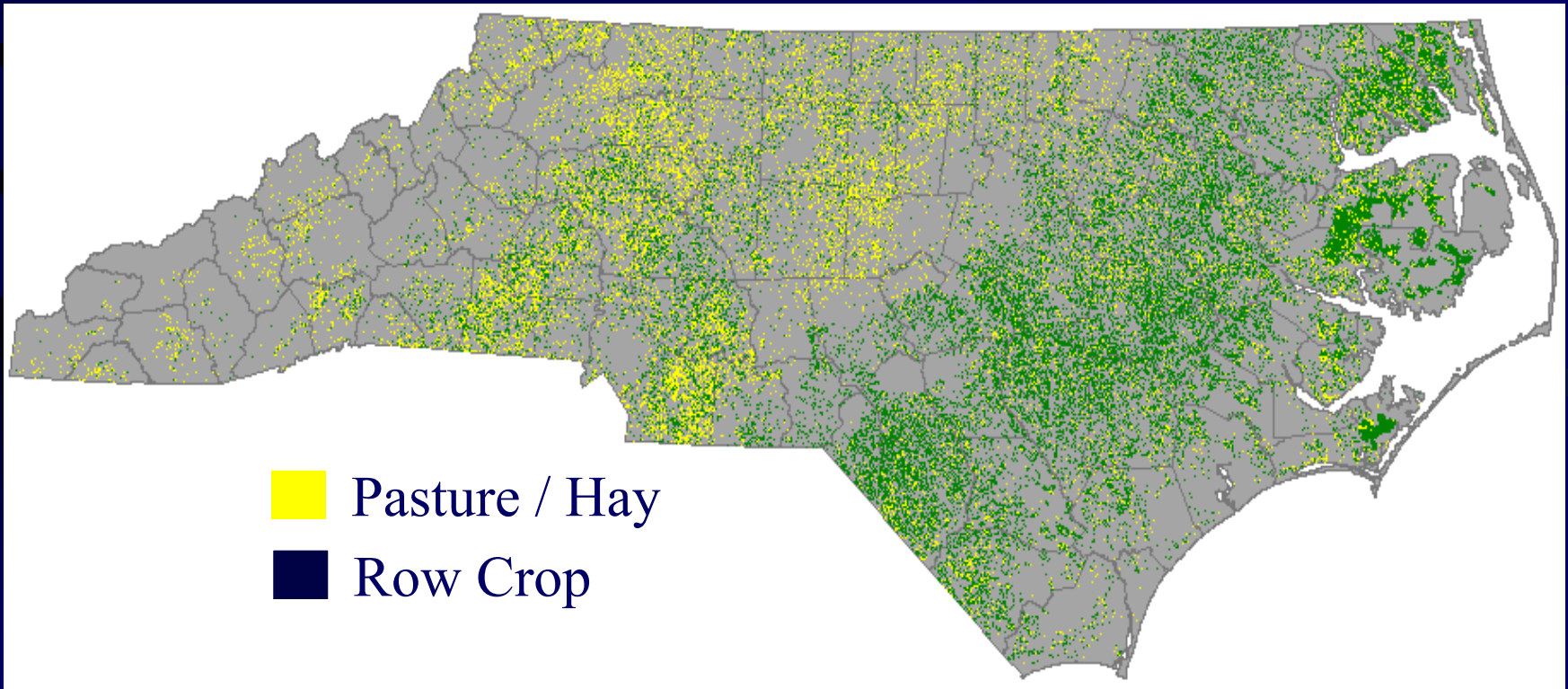
43 M Turkeys
$ 452 M
#1 US

9.6 M Swine
$ 1.7 B
#2 US

712 M Broilers
$ 1.7 B
#4 US

Crop Agriculture in North Carolina

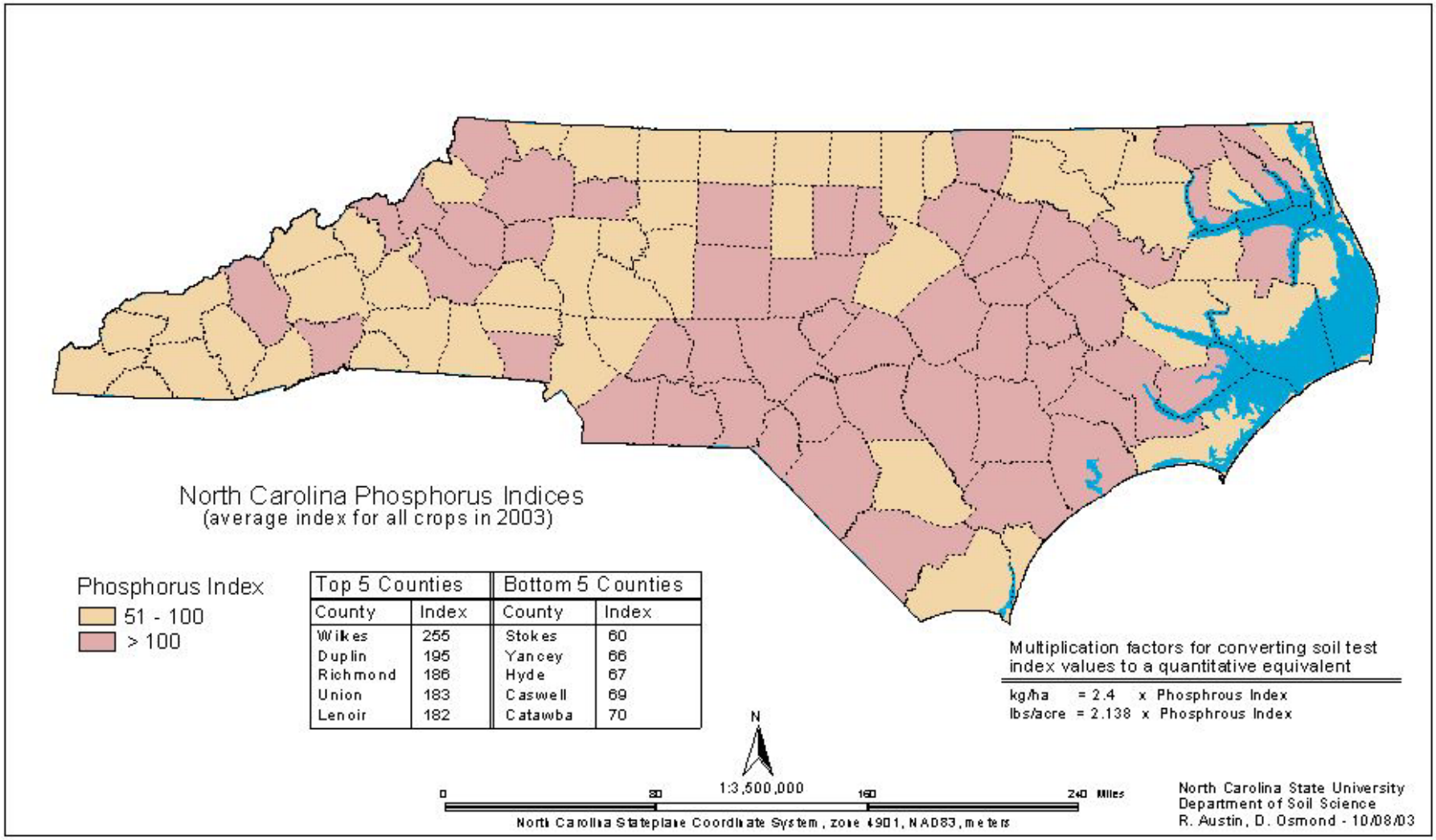
Crop Production and Physiographic Region



Soil Testing

- Conducted by NCDA&CS
- Free to farmers and homeowners, $2/sample for researchers
- ~300,000 samples per year
- 30 % fields below optimum pH
- 16 % fields above optimum pH
- 50 % fields > very high P

Average Soil Test Phosphorus



Top 5 Counties		Bottom 5 Counties	
County	Index	County	Index
Wilkes	255	Stokes	60
Duplin	195	Yancey	66
Richmond	186	Hyde	67
Union	183	Caswell	69
Lenoir	182	Catawba	70

Waste Analysis

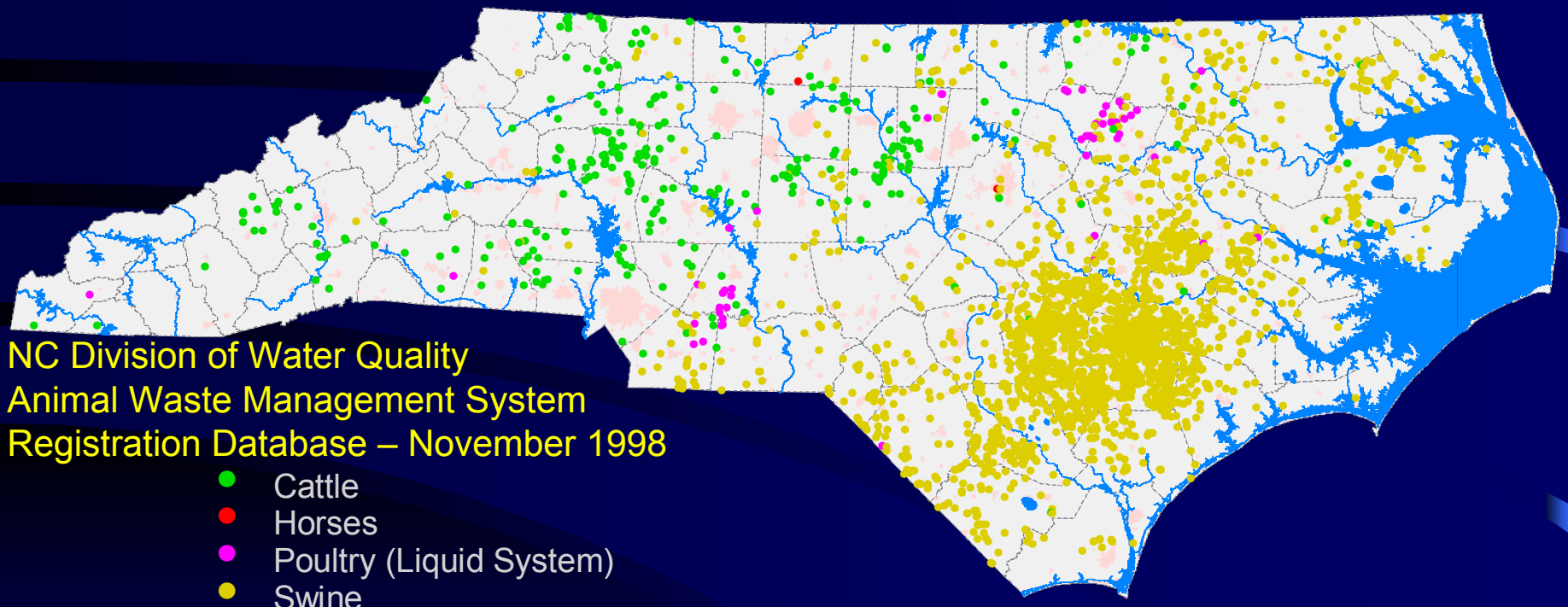
- Conducted by NCDA&CS
- $4 per sample
- ~18,500 samples per year
  - 11,000 swine
  - 4,000 poultry
  - 3,500 other
- Liquid waste
  - Sample analyzed within 60 days before or after application

Nutrient Abatement

Nutrient Management Regulations

Evolving since 1993……

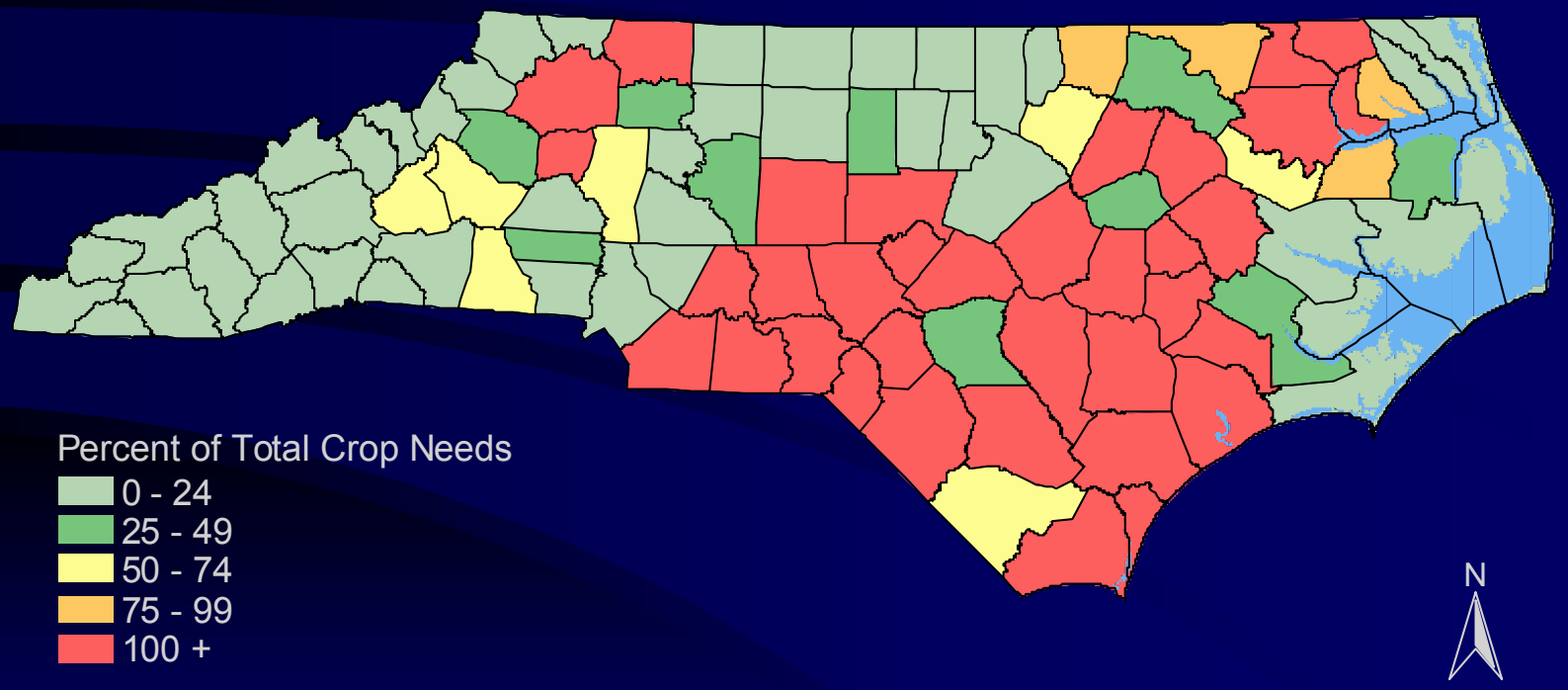
Livestock Production Distribution



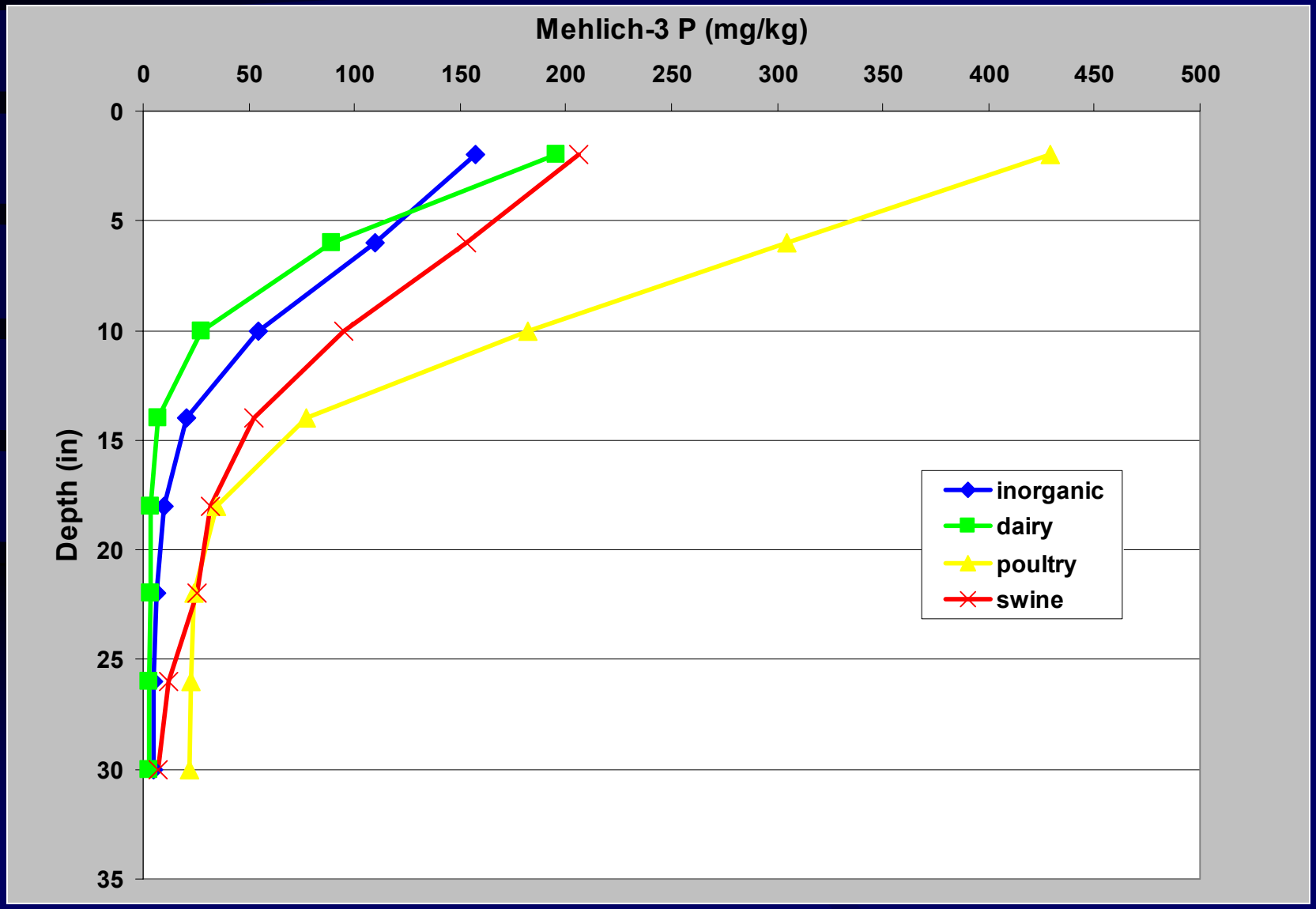
NC Division of Water Quality
Animal Waste Management System
Registration Database – November 1998

- Cattle
- Horses
- Poultry (Liquid System)
- Swine

Percent of Total Crop P Needs - 2000



M3P With Depth for Different Fertilizers



The First Mandate: .0200 (1993)

- Animal thresholds (3400 farms)
  - Cattle 100
  - Swine 250
  - Horse 75 head
  - Poultry * 30,000

    * w/ liquid system
- Certified Nutrient Management Plan compliance by 1997

Nutrient Management .0200 Requirements

- Regulated by the NC Division of Water Quality
- Operate under the guidance of a certified animal waste management plan (NRCS 590 nutrient management standard – N Based)
- Certification of waste plans by a "technical specialist"
- Training of technical specialist by NCCES

The Summer of 1995 . . .
Never a Dull Moment

N.C. hog population rockets to a record

That booming sound you just heard was the state's hog population exploding — again.

Despite lagoon spills, protests and a flood of unwanted publicity, North Carolina pork production is rocketing ahead at a record pace. New year-end figures for 1994 placed the state total hog inventory on Dec. 1 at 7 million animals —

Duplin County is now the No. 1 county in U.S. pork production

state on a given day — has pulled level with the human population for the first time. Total hog production — the number of animals sold in a year's time — is expected to surpass 13 million this year in North Carolina, now second only to Iowa in U.S. pork production.

Some major producers are predicting, however, that the rapid

Hog farm is fined $110,000 for spill

That booming sound you just heard was the state's hog population exploding . . . again.

Joby Warrick, News & Observer

Hog waste takes toll on river

The Next Mandate: Senate Bill 1217 (1996)

- Swine Farm Siting Act
- State Permits
  - Animal operations meeting the .0200 thresholds
- Poultry Dry Litter Plan
- Certification Training for Operators of Animal Waste Management Systems
- Inspection

Senate Bill 1217

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State Permits: Animal Waste Management Plans

All permit applications will contain an approved animal waste management plan

- odor control
- insect control
- animal mortality
- emergency management plans
- application rates
- record keeping
- waste and soil testing
- monitor Zn & Cu
- 5-year permit

Senate Bill 1217

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State Permits: Poultry Dry Litter Plans

Poultry farms with $\geq$ 30,000 (by January 1, 2000)

- Extension Agents Wrote Many of These Plans
- Nutrient Management Materials Developed by University Specialists
  - Soil and waste testing
  - N-based plans
  - Zn & Cu levels
  - record keeping
  - plans are not certified

Senate Bill 1217

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Certification Training for Operators fo Animal Waste Management Systems - Microsoft Internet Explorer

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Address http://ces.soil.ncsu.edu/certification/

Certification Training for Operators of Animal Waste Management Systems

Funding Received (1995-1998) = $380,000

Summary

Cooperators

Instructors

Policies

Continuing Education Requirement

Approved Continuing Education

Upcoming Training Opportunities

Upcoming Test Opportunities

Manuals

Questions?

d animal
acts on the overall
farming operation as well as the community. The negative consequences of a poorly managed waste application system can cost in terms of dollars, loss of land values, impaired environmental quality, and loss of good standing in the community.

The North Carolina General Assembly passed legislation in 1995 and 1996 requiring certification of operators of
agement systems tha
d animal waste
course on the
required fees. This
sic understanding
needed to operate and maintain these systems in an efficient and environmentally sound manner. This training program is not intended to provide all of the technical details for the complete design of a waste management system or an approved animal waste management plan. There are many good reference materials that have been published on these subjects that can provide more detailed information if desired.

Recertification – 6 hours every 3 years

Records available from this site

http://ces.soil.ncsu.edu/certification

Training complete in 1 1/2 years with 5000 operators trained and certified

Senate Bill 1217

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Moving Right Along: New Federal Guidelines

EPA CAFO

- Issued by EPA July, 2002
- Affect ~ 1100 liquid operations (few changes)
- Affect ~ 400 dry litter operations

NRCS 590 Standard

- NC Phosphorus Loss Assessment required

PLAT: Computerization

North Carolina Agricultural Nutrient Assessment Tool (NCANAT) v2.0

EXIT

Download Updates

Main | Record View | View Tables | About NLEW and PLAT | Credits

New Record | Get Record | Save Record | NLEW | PLAT | NLEW And PLAT | RESET | View/Print Results

Location

County

Mapping Unit

Identification

Calendar Year: 2002

Tract Number

Producer ID

Field Number

CALCULATE

Cropping Systems

Most Erosive Crop

BMPs

Enter BMPs...

BMP Count = 0

Nutrient Applications

Application Source And Rate

Nutrient Count = 0

Soil

Soil Loss (t/ac/yr)

Receiving Slope Dist.

ft.

Consultant and Agency PLAT Training

- RUSLE
  - 1 1/2 days
  - classroom
  - field exercise
  - test (70%)
- PLAT
  - 1/2 day
  - lecture
  - computer exercise
  - test

~ 400 agency personnel
~ 100 consultants
1 farmer

Percentage of Fields in Each PLAT Rating by Source

		--PLAT Index Category (%) --			
Source	n	Low	Med	High	V High
Dairy	20	60	15	20	5
Poultry	148	60	16	18	6
Swine	43	49	21	21	9
Inorg	1168	85	10	4	1

Two Interagency Technical Work Groups

- SB 12 17 Committee:
  - NCDENR-Divisions of Soil and Water and Water Quality, NCDA&CS, NC CES, USDA-NRCS
  - addresses issues and concerns related to animal waste management
- Nutrient Management Committee:
  - NCDENR-Division of Soil and Water, NCDA&CS, NC CES, USDA-NRCS
  - addresses issues and concerns related to nutrient management

NC State Soil Science, Nutrient Management Programs - MindSpring Internet Explorer

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Google Search Web Search Site PageRank Options

Department of Soil Science

College of Agriculture and Life Sciences

@NC STATE UNIVERSITY

Current Date: February 29, 2004

Search Site: GO

Program Links

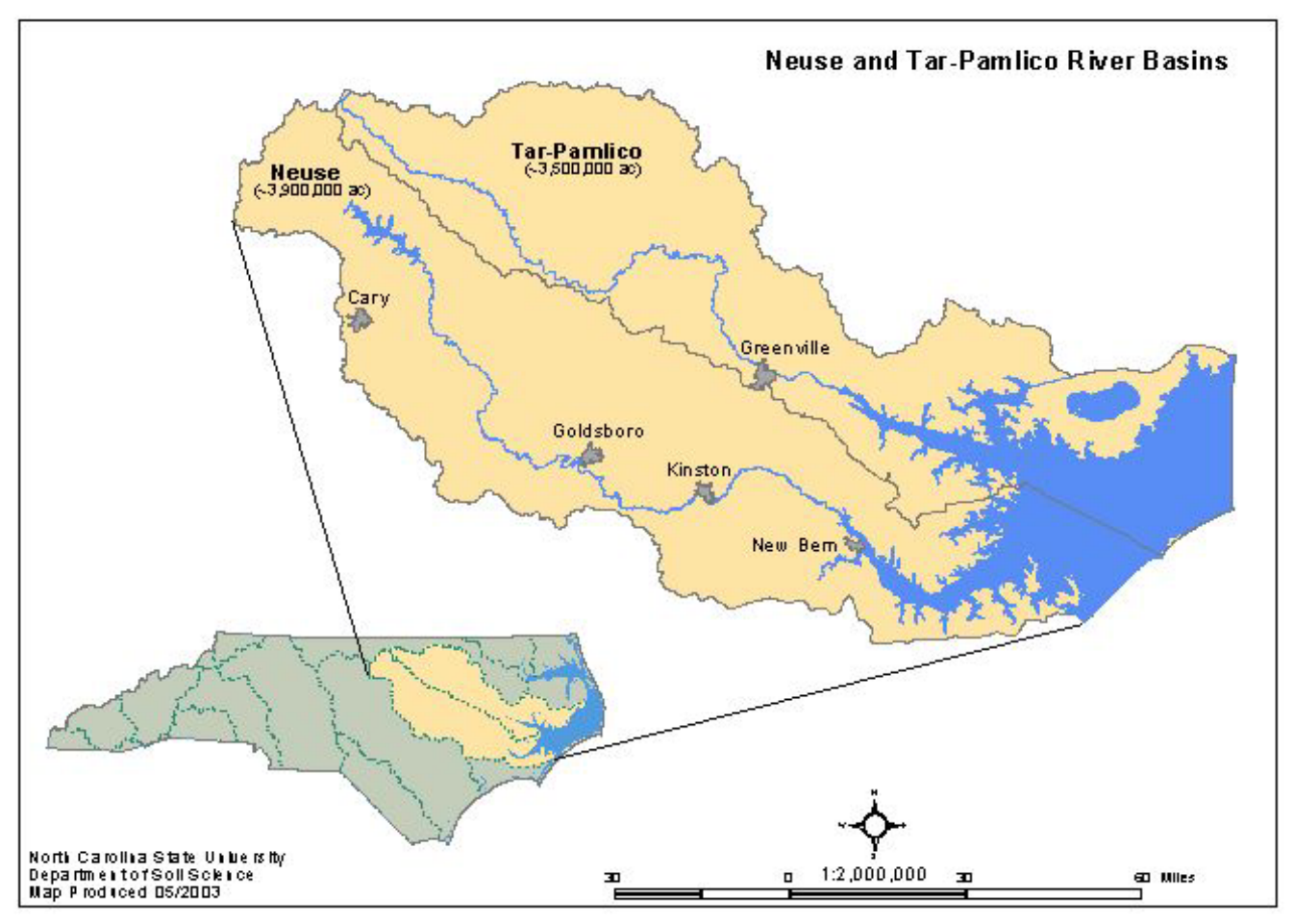
- Nutrient Management in North Carolina
- Basics of Soil Fertility
- Certification Training for Operators of Animal Waste Management Systems
- Neuse Education Team
- Nutrient Management Database Project
- Phosphorus Loss Assessment Tool

Nutrient Management

The relationship between agricultural productivity and environmental protection are essential areas of the research and extension programs in the Department of Soil Science. Previous departmental efforts in this area have resulted in improved nutrient recommendations for crop production and protection of NC water resources. With the tremendous growth in confined animal production in North Carolina during the past decade we have identified nutrient management as a high priority research and education area for the foreseeable future. Currently, our programs address:

Done Internet

Regulated River Basins



Neuse Rules

- Rules passed by the NC Environmental Management Commission
  - Point Sources
  - Urban Stormwater
  - Agriculture
  - Nutrient Management
  - Riparian Buffers

30% N Reduction in 5 Years (1998-2003)

Neuse Agricultural Rule: Mandatory Agricultural Practice

- 50 foot riparian buffer OR
- Nutrient management and 20 feet forested riparian buffer OR
- Nutrient management and 30 feet vegetated buffer OR
- Nutrient management and controlled drainage

Nutrient management plan had to meet NRCS 590 standard

Neuse River Agricultural Rule: Local Plan Option

- Participants choose to participate in Local Plan
- Local area defined by participants
- Local Plan must develop and use tracking tool to determine N reductions
  - Track implementation of BMPs (location & type of BMP)
  - Estimate N reductions from BMP implementation
  - Quantify N reductions as land use changes
- Nutrient Management Plans ~ 250,000 acres

Nutrient Management Rule

Certified Nutrient Management Plan

or

Nutrient Management Training by NC Cooperative Extension

Neuse River Basin Rule: .0239 Nutrient Management Education

One-day training (~ 6 hr)

1: How water moves

2: Water quality problems

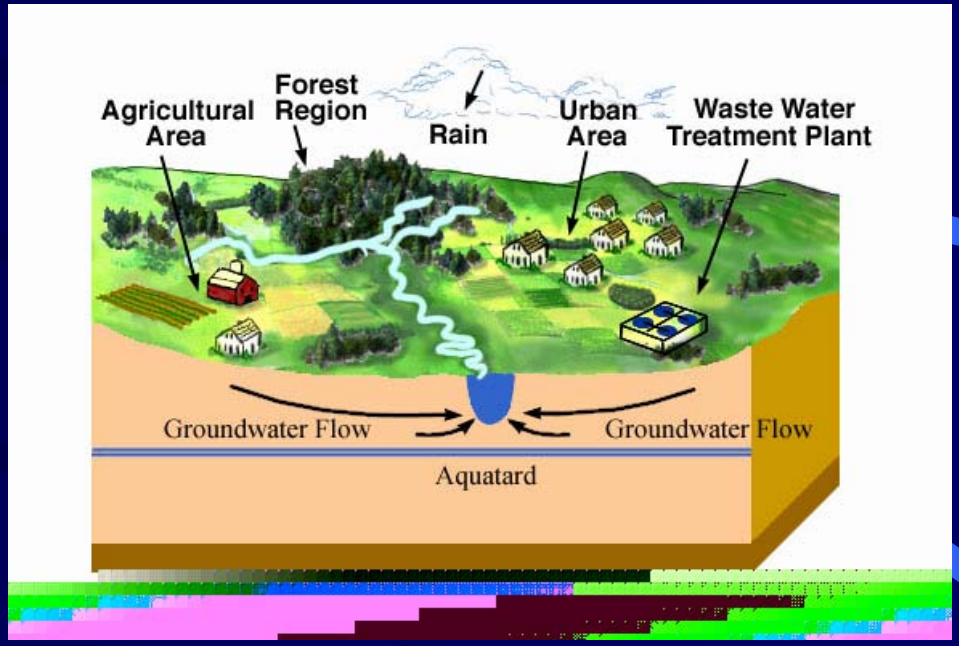
3: Sources of nutrients

4: BMPs

5: Intro to nutrient mgt

6: Soil testing

7: Commodity based nutrient management



Types and Numbers of Individuals Trained

Type of Applicator	Numbers
Agriculture	~ 1400
Lawn Care	~ 500
Container Nursery	~ 50

Issues

- To name just a few
- NC PLAT validation
- P lateral movement & buffers
- N mineralization rates - materials
- Soil test calibration & tissue testing (not event driven)
- Traditional “dirt and fert” research
- Continued need for “local” BMP data
- Need for nationally synthesized BMP data