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Webinar for the
State Level Nutrient Reduction Strategies – Agriculture Component Workshop
Wednesday April 11, 2012

Michelle Perez, Senior Associate, World Resources Institute.

Talk title: *Does Regulating Farmers Work? Lessons from Three Chesapeake Bay State Nutrient Management Laws*

ABSTRACT

Michelle will share highlights from her dissertation entitled “Does the policy-making process affect farmer compliance? A three-state case study of nutrient management regulations.” In response to a series of fish kills that occurred in 1997 which were linked to the toxic micro-organism *Pfiesteria piscicida*, Maryland, Virginia, and Delaware enacted state laws requiring farmers to obtain and follow a nutrient management plan. To find out how well farmers were following their plans and whether the policy process affected their willingness to comply, Michelle interviewed 60 farmers on the Delmarva Peninsula who grew corn and used poultry manure as a fertilizer. She also interviewed over 60 policy stakeholders and evaluated eight years of compliance data from the state regulatory agencies. Michelle will share lessons learned about regulating nonpoint source agricultural nutrient pollution.

BIO

Michelle Perez is Senior Associate at the World Resources Institute where she leads the Mississippi River Basin nutrient trading feasibility project and the federal conservation funds targeting project for the Water Quality Team. Michelle received a doctorate in environmental policy from the University of Maryland, School of Public Policy in May 2010. Her dissertation is a comparative case study of agricultural nutrient regulations in Delaware, Maryland, and Virginia. She has a Masters degree in environmental policy from Maryland and an undergraduate degree in biology from Occidental College. Previously, Michelle was with the Environmental Working Group where she evaluated voluntary and regulatory programs addressing agricultural nutrient and sediment pollution, at both the state and federal levels. Before that, she worked for the Alliance to Save Energy on international energy efficiency issues in China, India, Mexico, and the Philippines. Michelle also serves as the President of the National Capital Chapter for the Soil Water Conservation Society.

**Regulating
Farmers:
A three-state
case study of
nutrient
management
laws on the
Delmarva
Peninsula**

Dr. Michelle R. Perez

University of Maryland School of Public Policy

2010 Dissertation Highlights

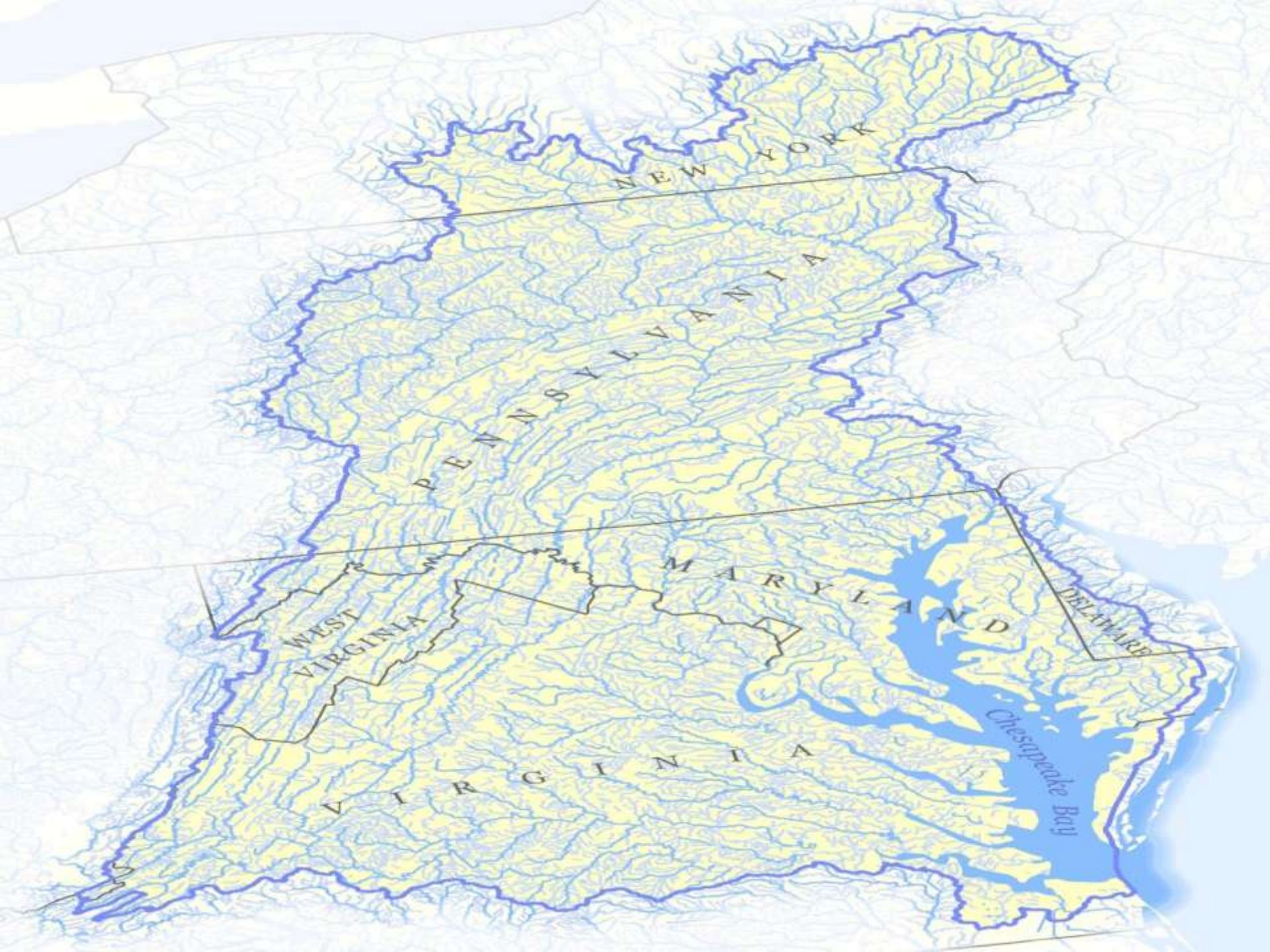
State Level Nutrient Reduction Strategies Webinar

April 11, 2012



Outline

- Focusing event
- Methods
- State differences
- Answers to research questions
- Lessons learned about regulating agriculture



NEW YORK

PENNSYLVANIA

WEST VIRGINIA

MARYLAND

DELAWARE

VIRGINIA

Chesapeake Bay









Research Questions

1. Did the policy processes affect compliance?
2. Did the laws improve nutrient management?

Methods

- Data
 - over 60 farmers and 75 stakeholder interviews
 - 26 Likert Opinion Statements
 - 8 years of state regulatory agency data
- Analysis
 - Political and policy analysis case study
 - Statistical analysis: Fischer's Exact Test
 - Logit regression model



Farmer Similarities

- 50 average age
- >90% finished H.S.
- 1,480 average acres
- 50 to 70% corn-wheat-soybean rotation
- 50 to 85% poultry growers
- High participation : cover crops & manure shed
- Low participation: conservation plan, manure transport, conservation buffer, EQIP

Differences between states

- Political cultures and policy making processes
- Regulatory requirements
- Implementation schedule
- Enforcement effort

Similarity between states

All 3 states required a certified nutrient management plan to “optimize crop yields and minimize environmental losses”

Policy Processes Were Different

| | Maryland | Delaware | Virginia |
|----------------------|---------------------------------------|---------------------------------------|---|
| Political Style | Contentious | Collaborative | Negotiated |
| Bay & Env'tl Culture | Very Strong | Limited | Limited |
| Problem Diagnosis | Burdened | Skipped it | "Go slow" |
| Policy Deliberations | Enviros dominated & internal pressure | Farmers dominated & external pressure | Farmers slight edge & internal pressure |

Requirements Were Different

| | Maryland's 1997 Water Quality Improvement Act | Delaware's 1999 Nutrient Management Law | Virginia's 1999 Poultry Waste Law |
|-------------------------------------|---|--|--|
| Requirements | "All" farmers need plans + 4 practices (n=16,000 down to 5,902) | "All" farmers need plans + 2 practices (n=6,775 down to 1,158) | Poultry growers need plans + 8 practices (n=1,309 down to 890) |
| Requirements for Integrators | Use <i>phytase</i> in feed & pay 50% of manure transport | Provide growers with technical & financial assistance | |
| Phosphorus policy | Phosphorus Site Index | 3-yr P crop removal rate | Options depending on location |

Implementation Was Different

| | Maryland's 1997 Water Quality Improvement Act | Delaware's 1999 Nutrient Management Law | Virginia's 1999 Poultry Waste Law |
|------------------------------|--|--|--|
| Regulatory agency | MDA | DNMC | VDCR & VDEQ |
| Implementation | 3.5-yr roll-out "nightmare" | 3.5-yr delay, 5-year roll-out "dream" | 3-yr roll-out "dream" |
| Cost-share | For NM plans and manure transport | | Limited support |



MARYLAND –

“Agriculture was in a defensive mode from the day it started till the day it ended. They looked on us as criminals.

“It was war. The rhetoric was so ferocious; there was no discussion. “

ALTHOUGH - “To this day, I still believe the government has the right to regulate what I do. It’s crazy that farmers don’t think that they do. Nutrient management nearly destroyed Farm Bureau.”

Stakeholder comments about process



DELAWARE –

“We realized early on that we had to deal with farmers – meet them at the table, listen to them, involve them in the process... If we had taken a strident regulatory position, we would have been defeated in two weeks. We had a job to do to satisfy EPA CAFO rules and knowing that we’d have to deal with TMDLs in the future.”

“The smartest thing we did in our lives was to tailor the bill to accommodate the farmers’ needs.... The people involved in the early construction of the law, turned out to be smart as hell and good farmers. ... Of course, we still had screaming and yelling and stomping out of the rooms at different times on both our parts...But, I think we each earned each other’s respect. ”

Stakeholder comments about process



MARYLAND –

We didn't have no fair say in it. All the meetings I went to (in Salisbury), any time a farmer tried to say something, they didn't want to hear it. They would just disagree. It seemed like we were beaten before we ever talked."
(Farmer 36, Wic)

Farmer comments about process



DELAWARE –

**“They’re trying in Delaware to work with the farmer as much as possible. Not this overbearing crap, my way or the highway, like in Maryland.”
(Farmer 42, Sus)**

“We govern ourselves. We wrote our own rules. We worked things out so that farmers did it themselves.” (Farmer 49, Sus)

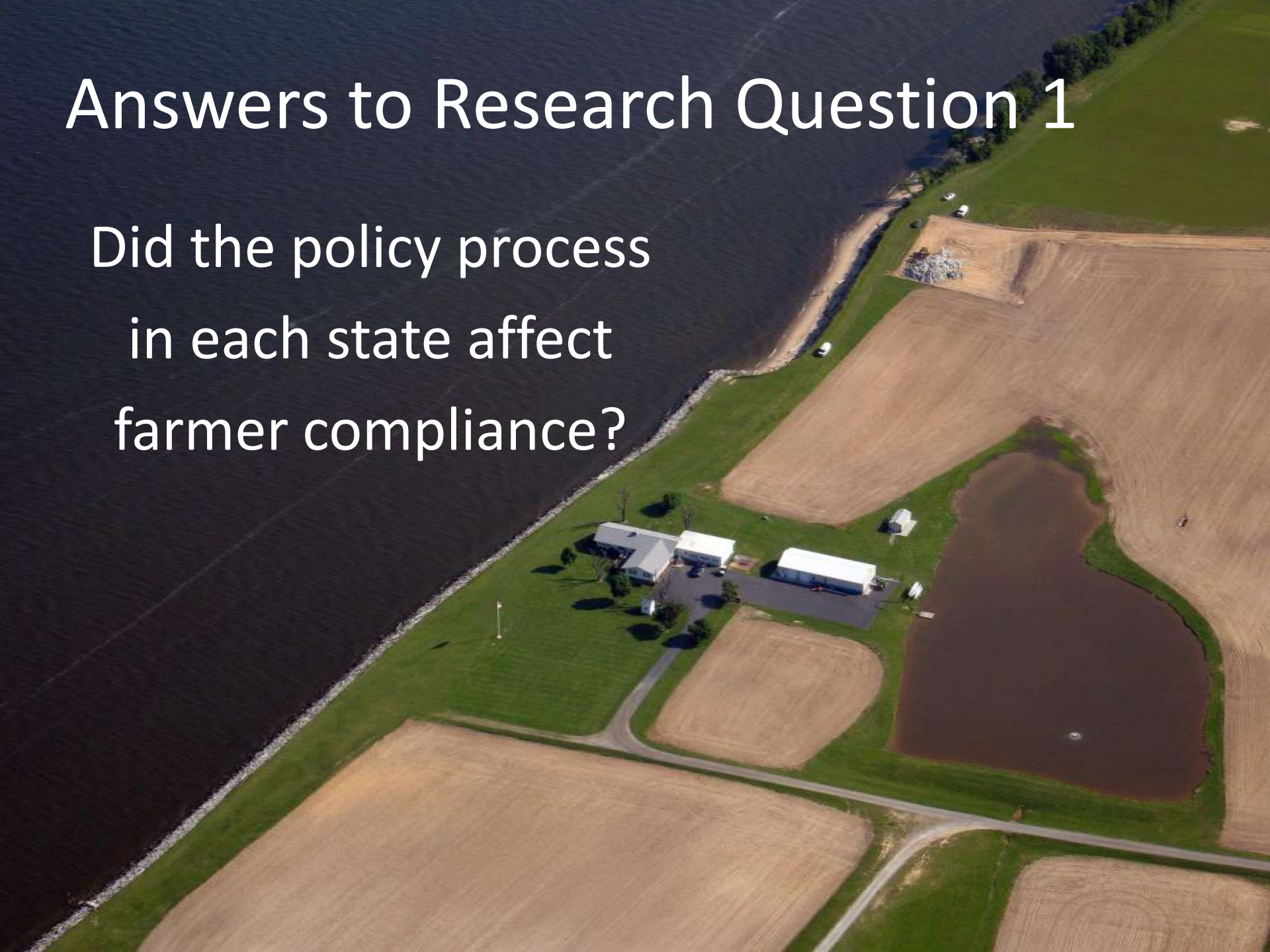
Farmer comments about process

Overarching Findings

- It was difficult (for the states and for me) to determine compliance with plan regulations
- Answers to research questions are overall, “yes,” but there are “no” answers
- Regulations have made a difference but there’s room for improvement

Answers to Research Question 1

Did the policy process
in each state affect
farmer compliance?



Yes, state data suggests process affects compliance

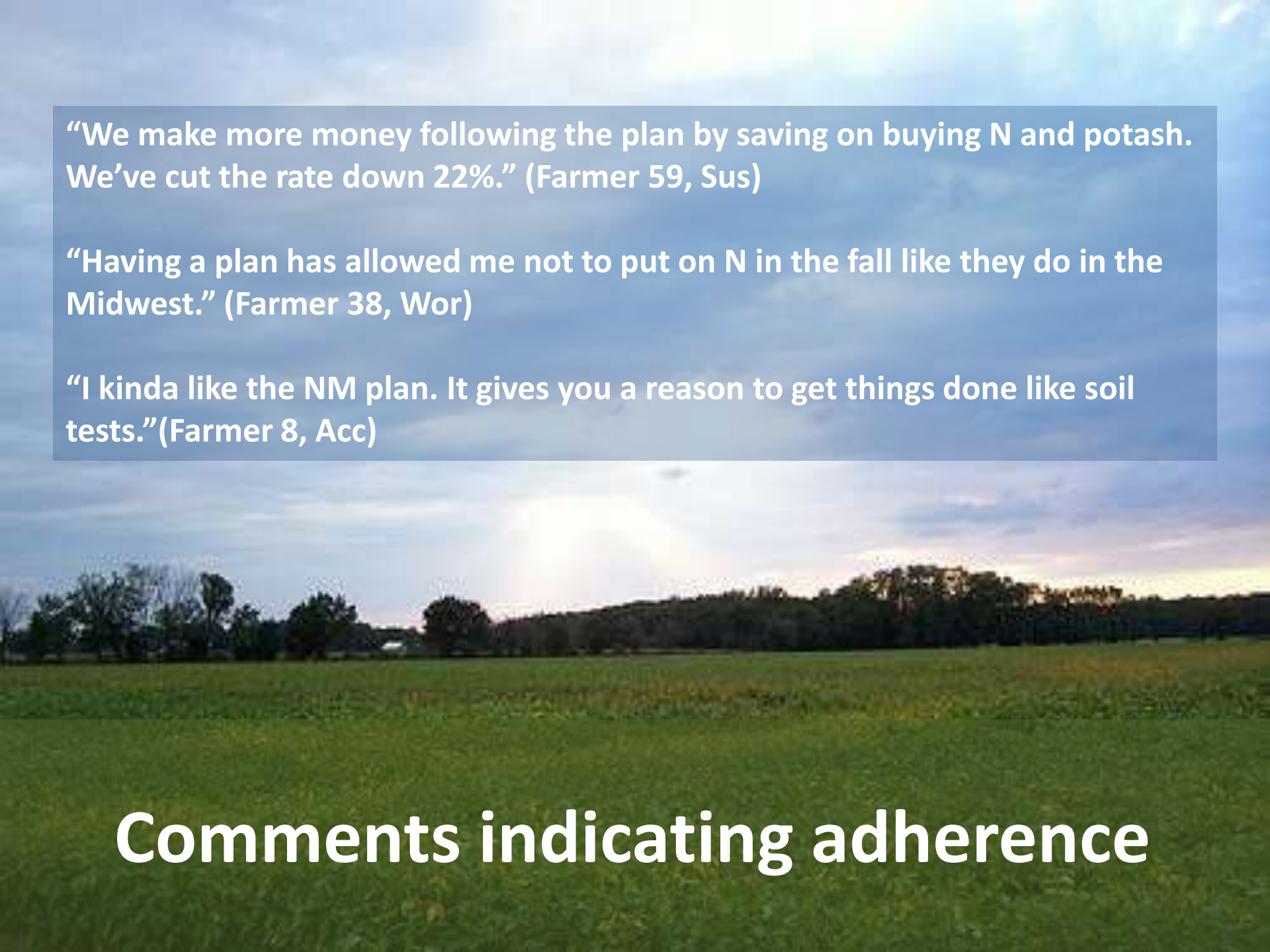
| State agency datasets | MD n=5,902 farmers | DE n=1,158 farmers | VA n=894 poultry growers |
|---|--|---|-----------------------------|
| 1st Administrative Compliance | 30% NMP + 60% Delay forms (2001) | Acres covered ahead by 2 years (2003) | Near 100% (2001) |
| 2008 Administrative Compliance | 98% NMP, 99% AIR | 70% NMP acres, 38% AR forms | Near 100% |
| 2008 Inspection Rates | 8% n=450 of 5,902 | 2% n=25 of 1,158 | 93% n=962 of 1,040 |
| 2008 Adherence Compliance Rates | 65% n=158 of 450 | 84% n= 21 of 25 | 88% n=838 of 962 |

Yes, Likert responses suggest process affects compliance

- Most MD & VA farmers (SS)
 - Disagreed “Would be satisfied with crop if strictly followed plan”
 - Agreed “Plan is too conservative”
 - Agreed “Regulations are too strict”
 - Disagreed “Law is justified”
- Most DE farmers hold the opposite views

No, interview comments suggest compliance is poor across all 3 states

- Asking “Are you following your nutrient management plan?” didn’t work
- 62% gave comments about adherence to plan
- Non-adherence comments outnumbered adherence 1.6 to 1 (NSS)



“We make more money following the plan by saving on buying N and potash. We’ve cut the rate down 22%.” (Farmer 59, Sus)

“Having a plan has allowed me not to put on N in the fall like they do in the Midwest.” (Farmer 38, Wor)

“I kinda like the NM plan. It gives you a reason to get things done like soil tests.”(Farmer 8, Acc)

Comments indicating adherence

Comments indicating non-adherence

“Extension recs aren’t worth the paper they’re on. We rely on our fertilizer company and lab results for our true recommendations. (Farmer 35, Wic)

“ Once you get below 3t/ac, there’ll be flow problems. The 1.5 t/ac rate in my plan is ridiculous.” (Farmer 56, Sus)

“If we’re cleaning out in winter and there’s no where to store it, we’ll spread it to get rid of it.” (Farmer 7, Acc)



No, compliance with or adoption of
specific BMPs is poor
across all three states (NSS)

| Requirements or Guidance | | MD n=30 | DE n=20 | VA n=5 | Stat. Sig. Diff.? |
|----------------------------|--------------------------|------------|------------|-----------|----------------------|
| All 3 states require | Have a plan | 77% | 95% | 100% | No |
| | 3-yr soil tests | 73% | 95% | 100% | Yes |
| | Residual N credits | ~20% | ~20% | ~20% | No |
| VA | 3-yr manure tests | 60% | 95% | 80% | Yes |
| MD | 2-yr manure tests | 43% | 65% | 60% | No |
| VA | PSNT or stalk test | 70% | 50% | 40% | No |
| VA | Split apply fertilizer | 80% | 85% | 90% | No |
| VA | 1-yr Calibrate spreaders | 20% | 20% | 20% | No |
| VA | Manure-free setbacks | 37% | 20% | 40% | No |
| MD & VA | Winter manure ban | 27% | 35% | 0% | No |

Yes, DE says their law improved practices & is solving problems

- 2008 UDE report: DE's N and P surpluses have been cut in half
- 2008 DNMC analysis: DE's excess manure problem shrunk to nearly null
- Though DE's 3-yr P crop removal policy helped lower manure rates but it violates Sufficiency Concept

Yes, laws improved practices

- “Did you change your fertilizer or manure use because of the law?” (SS but NRR high)
 - 62% responded
 - Most said “yes” indicating at least 40% MD, 45% DE, & 80% of VA farmers have improved
 - Even 4/5 unregulated VA farmers said they changed their practices because of the law

What improved?

- “Greater awareness of nutrient management”
- Reduced purchases of commercial P
- Lowered N concentrations in fertilizer mix
- Lowered poultry manure rates
- Increased frequency of manure testing
- Reduced manure disposal by poultry growers

Yes, laws improved manure rates

- Manure rate on corn (SS)
 - 75% DE farmers said used 2 t/ac or less on corn
 - Only 47% MD & 40% VA farmers said so
 - Overall “good news” as 60 to 97% farmers in all 3 states report using 3 t/ac or less

Significant factors driving low manure rates

- Logit regression model (NSS)
 - Farmers are more likely to use 2t/ac or less if they
 - Agreed “Farmers had an equal seat at the policy making table”
 - Agreed “Manure use to meet corn N needs exceeds corn P needs”
 - Used private planners
 - State variable NSS

No, laws have not improved understanding of nutrient science

- Only half of all farmers understand that manure use to meet N needs of corn exceeds corn P need
- Few agree that soluble P can runoff soils separately from soil erosion
- About half identify with the old “Maintenance” approach to nutrient application

No, still only minimal acceptance of ag-environmental problems

- Most disagreed “Ag makes up the majority of N and P loading to the Bay”
- Just over half agreed “Some counties on the Delmarva produce more manure than can be applied at agronomic rates”
- Just over half agreed “In the past, poultry growers disposed of manure”
- Nearly all agreed “Protecting the environment is part of what it means to be a farmer.”

Why some farmers don't follow their NM Plan

- Most common reasons:
 - Don't want to set average yield goals but want ever-increasing yields
 - Want to apply according to the Maintenance rather than Sufficiency philosophy
 - Think they'll go out of business if they follow plan
 - Don't want to apply low phosphorus manure rates because have to buy commercial N fertilizer

Concerns about collusion b/w farmers, crop consultants, & fertilizer dealers

- Some farmers and private planners colluded:
 - Keep double books
 - Apply higher manure rates than should
 - Set higher than average yield goals to justify higher nutrient rates
 - Not take residual N credits
- Some farmers with public planners went to fertilizer dealers for their “true” rates

Concerns about regulatory capture

- DE's regulatory body is dominated by the regulated
 - Failed to determine why 30% of farmers don't have plans and no fines have been levied
 - Failed to achieve their 10% inspection goal (only 2%)
- VA's Poultry Waste Law allows over 60% of poultry manure to go unregulated
- MD, like all states, allows consultants who submit problem plans to go un-penalized



5 Main Themes
About
Regulating
Farmers

Plan-based agricultural
regulations are, in reality,
voluntary





Plans prepared
by private &
public planners
result in non-
uniform
regulatory
standards

Gaining “buy-in” rather than
“alienating” the regulated parties
likely results in better outcomes



Regulations that
account for
realities of
farming &
state regulatory
capacity
likely achieve
better overall
outcomes





Focusing events that turn out to be weak can undermine new regulatory policies

Policy recommendations for improving compliance and NM practices

- Investigate and close educational gap between farmers, scientists & economists
- Capitalize on “farmer environmentalism” sentiment to counter misperceptions
- After years of “compliance assistance,” try a credible threat of deterrence
- Target enforcement against non-compliant farmers, private planners, & fertilizer dealers

Policy recommendations going forward and for other states

- Gain buy-in from farmers through a collaborative rather than a coercive policy making process
- Be careful of regulatory capture
- Require easily monitored and verified practices
- Establish realistic implementation schedules
- Require changes to achieve specific water quality goals
- Require changes that will have a major impact (*phytase*)
- Target \$ support to major impacts (manure transport)
- Partner w/ Integrators to end winter “Total Clean Outs”

The background of the slide is a photograph of a sky at sunset or sunrise. The sky is filled with dark, textured clouds, with a bright, glowing horizon line where the sun is setting or rising. The foreground is dark and shows the silhouette of a line of trees or a field.

*Questions
& 1 Request*

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Dissertation Articles

- Choices Magazine (AAEA 2011) – 4 pages
http://www.choicesmagazine.org/magazine/pdf/cmsarticle_176.pdf
- On the Waterfront (WWW 2010) – 12 pages
http://www.worldwaterweek.org/documents/Resources/Best/2010/OntheWaterFront2010_FINAL.pdf
- Dissertation (2010)
<http://gradworks.umi.com/34/09/3409721.html>