Voluntary and Regulatory Approaches to Reducing Nutrients: Lessons Learned from the Mississippi River Basin and the Chesapeake Bay

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WRI's Water Quality Team Goal

To reduce eutrophication in coastal zones and lakes by helping to develop and adopt effective strategies for controlling nutrient pollution, including performance- & market-based policies & measures.

To clean up local, state, and regional water bodies, we have several approaches:

- **Voluntary (conventional and innovative)**
- **Quasi-regulatory**
- **Regulatory**
- **Market-based**

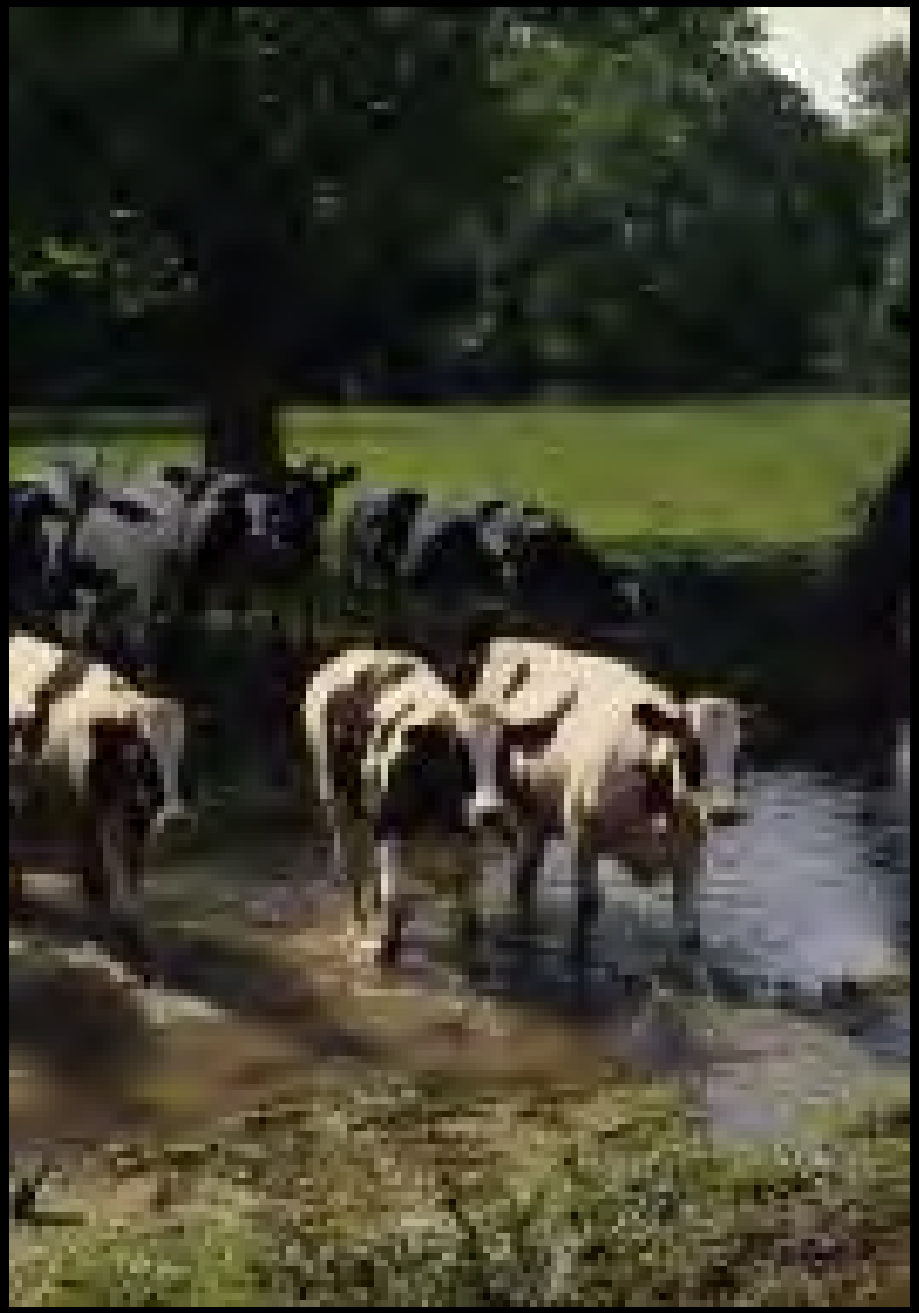
Highlights from:

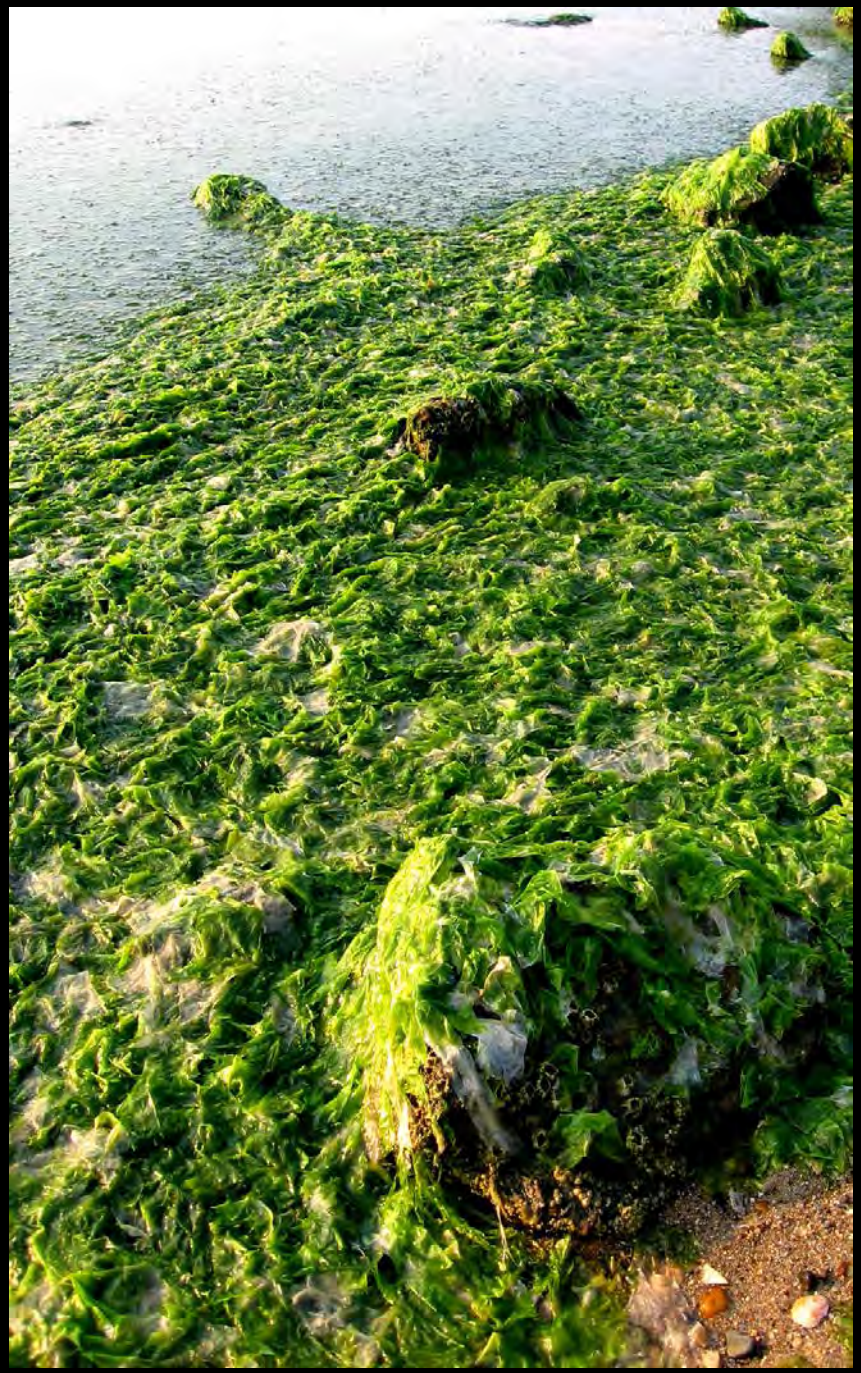
- 10-MRB state EQIP report (2008)
- 6-Chesapeake Bay state regulations report (2009)
- 3-state dissertation on regulating farmers with NM plans (2010)

Voluntary approaches are limited

- Despite nearly $5 B/yr in federal conservation funds, only 13% of all farmers receive cost-share*
- Single, “Random Acts of Conservation” are too dispersed

* Claassen & Morehart. 2006. USDA ERS.





Only 2 EQIP "Special Projects" as of '07

- Illinois' Spoon River Special Project for stream bank stabilization (7% IL-EQIP funds)
- Iowa's Supershed Projects (4 % IA-EQIP funds)

Try (or hone & replicate) innovative voluntary approaches

- Pay for performance instead of practices
- Quantifying economic losses of over-application
- Transform voluntary approach from field-scale to watershed-scale

Watershed-scale project straw man

1. Identify high priority locations
2. Establish partnerships in those locations
3. Set quantitative & qualitative environmental goals
4. Translate envt'l goals into field-scale N, P, S indicators & farmer behavior change goals
5. Outreach & implement
6. Measure , monitor, communicate success

Voluntary signal

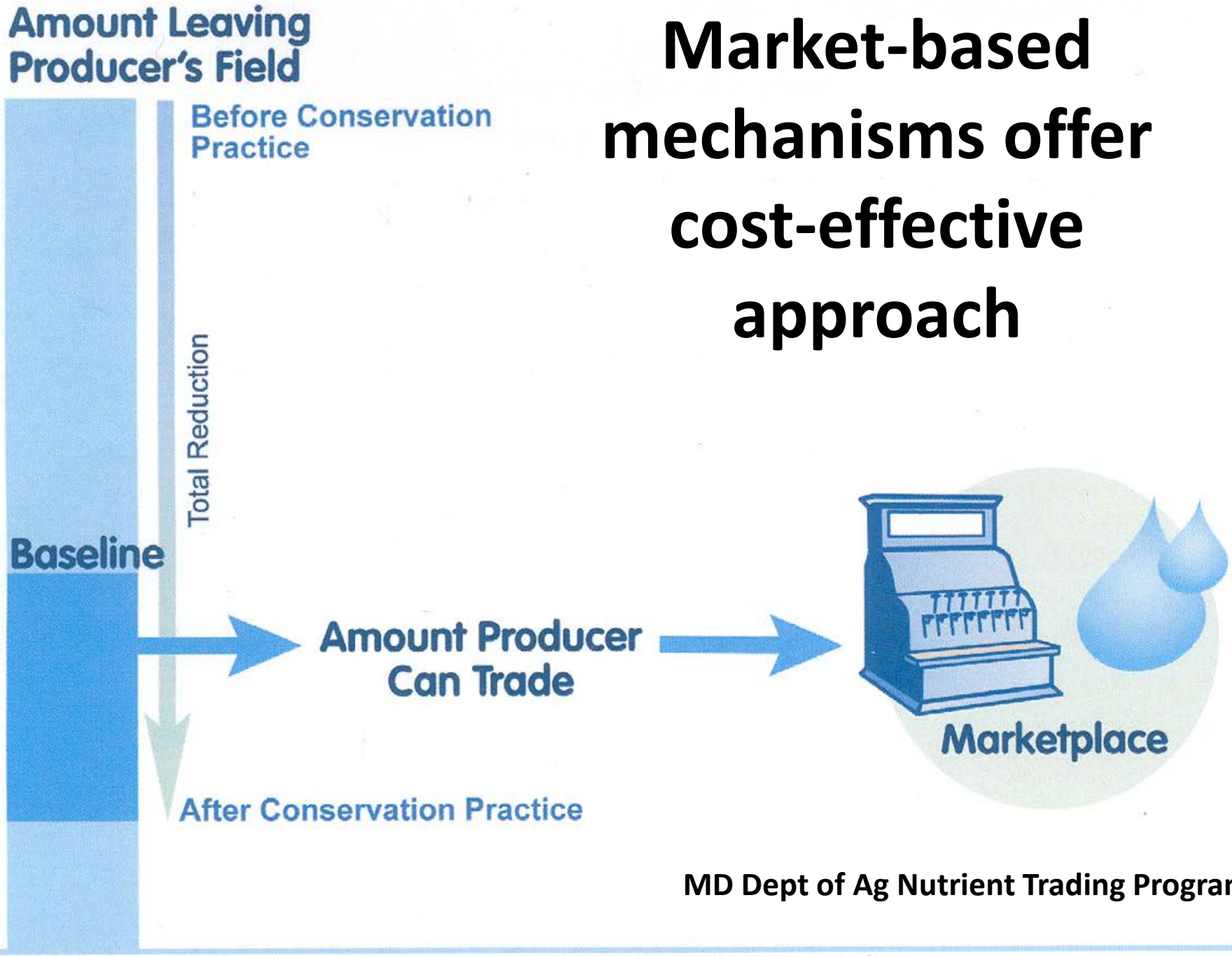
Is weak as it doesn’t guarantee enough of the right folks in the right places will make enough of the right behavior changes

Quasi-regulatory approach was a success

- Conservation compliance credited with 1/3 the soil erosion reduction since ‘90*
- Is expanding compliance to crop insurance and to nutrient management practices a reasonable performance standard for ag?

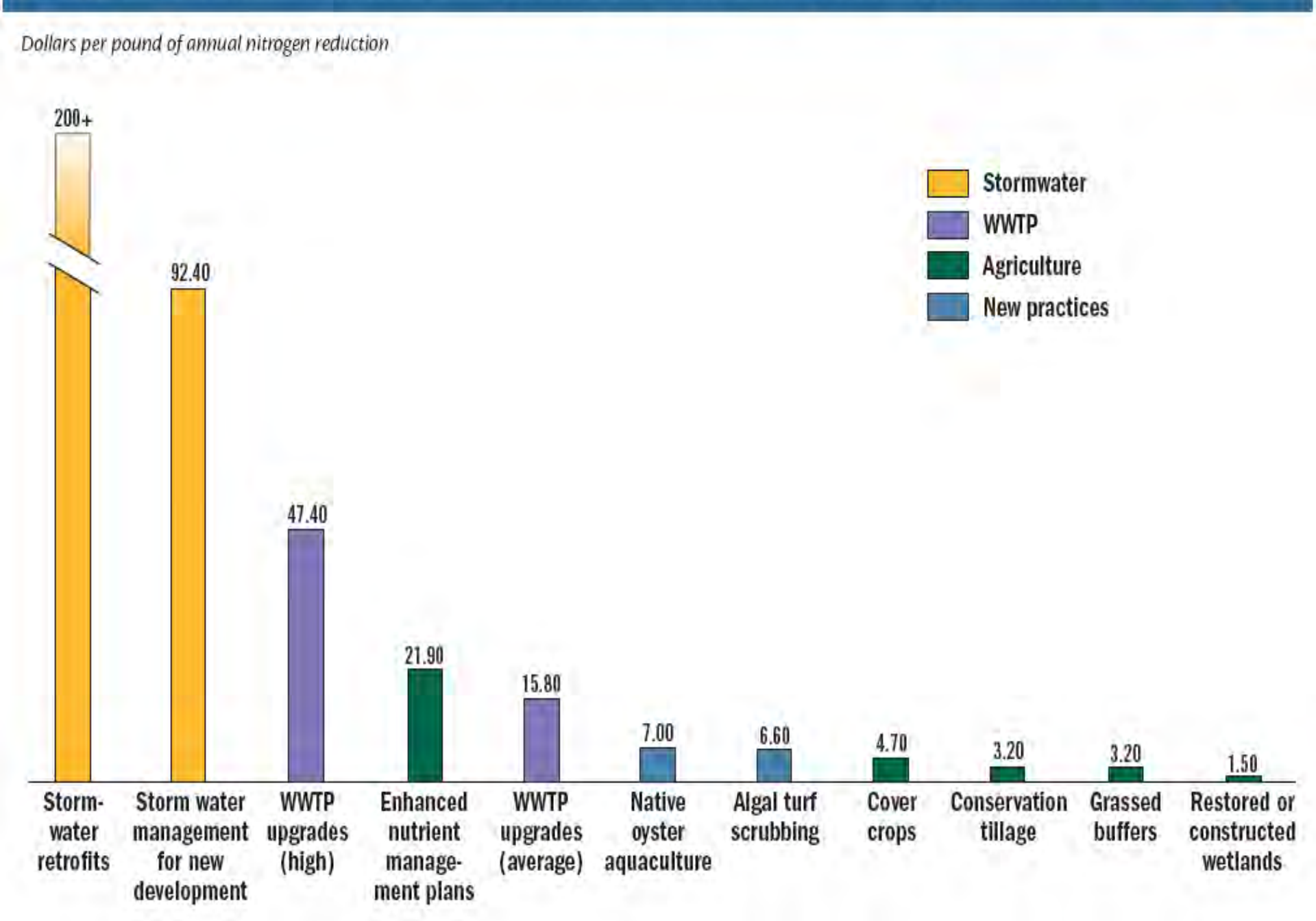
* Claassen. 2007. USDA ERS.

Market-based mechanisms offer cost-effective approach



MD Dept of Ag Nutrient Trading Program

Figure 2 | **Nitrogen Reduction Costs Differ Among Sectors and Practices, Creating Economic Opportunities for Credit Trading**



Regulatory approach has its merits

- Reasonable to expect a level of environmental stewardship from farmers
- Justifiable to require farmers causing harm to the environment to stop doing so
- Rationale that government protects the public interest by signaling to farmers to internalize their externalities
- Decades of a voluntary approach but water quality hasn't improved & likely to get worse as food & energy demands increase

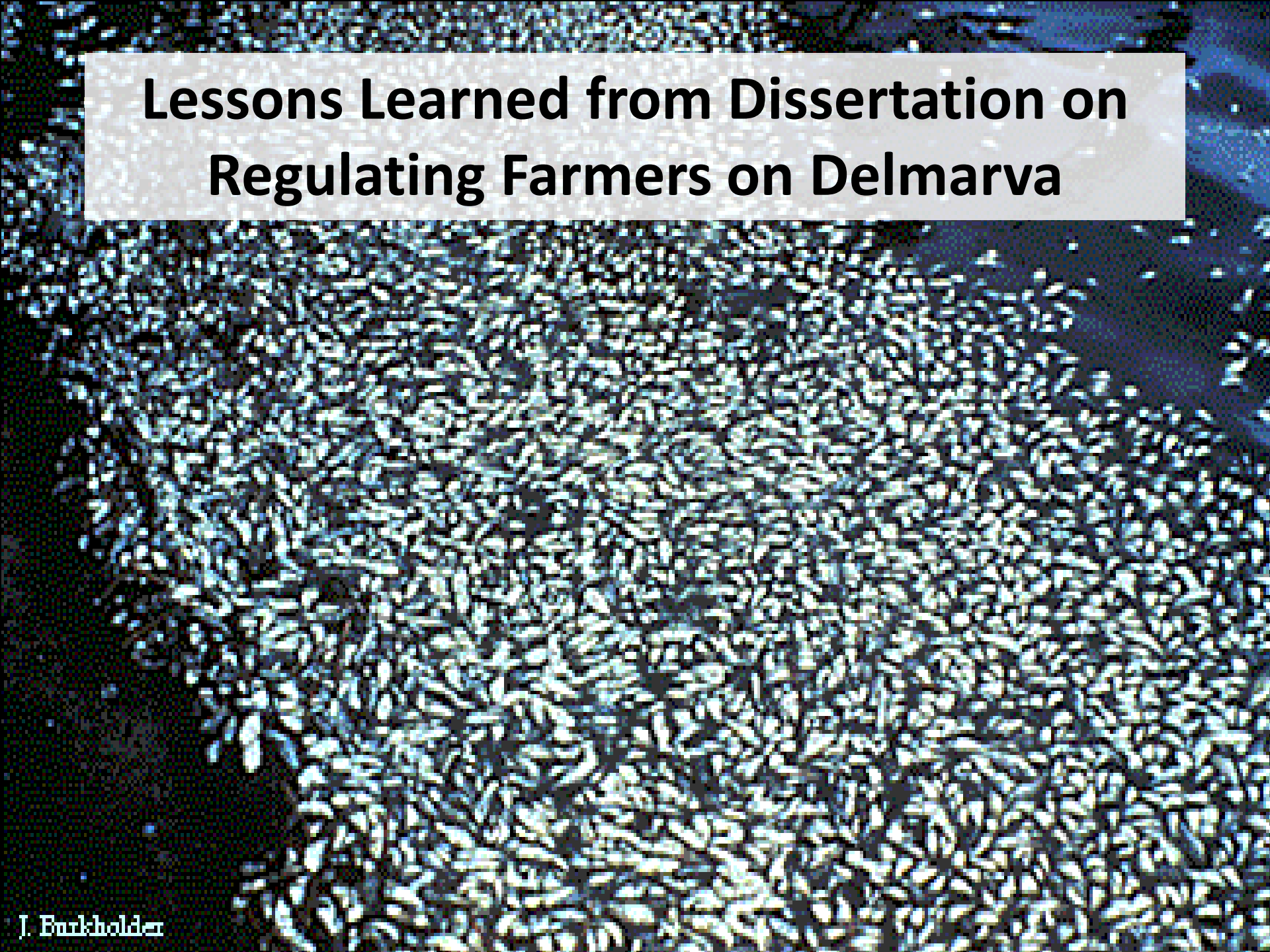
We have a patchwork of well-intentioned but poorly designed & implemented state & federal regulations

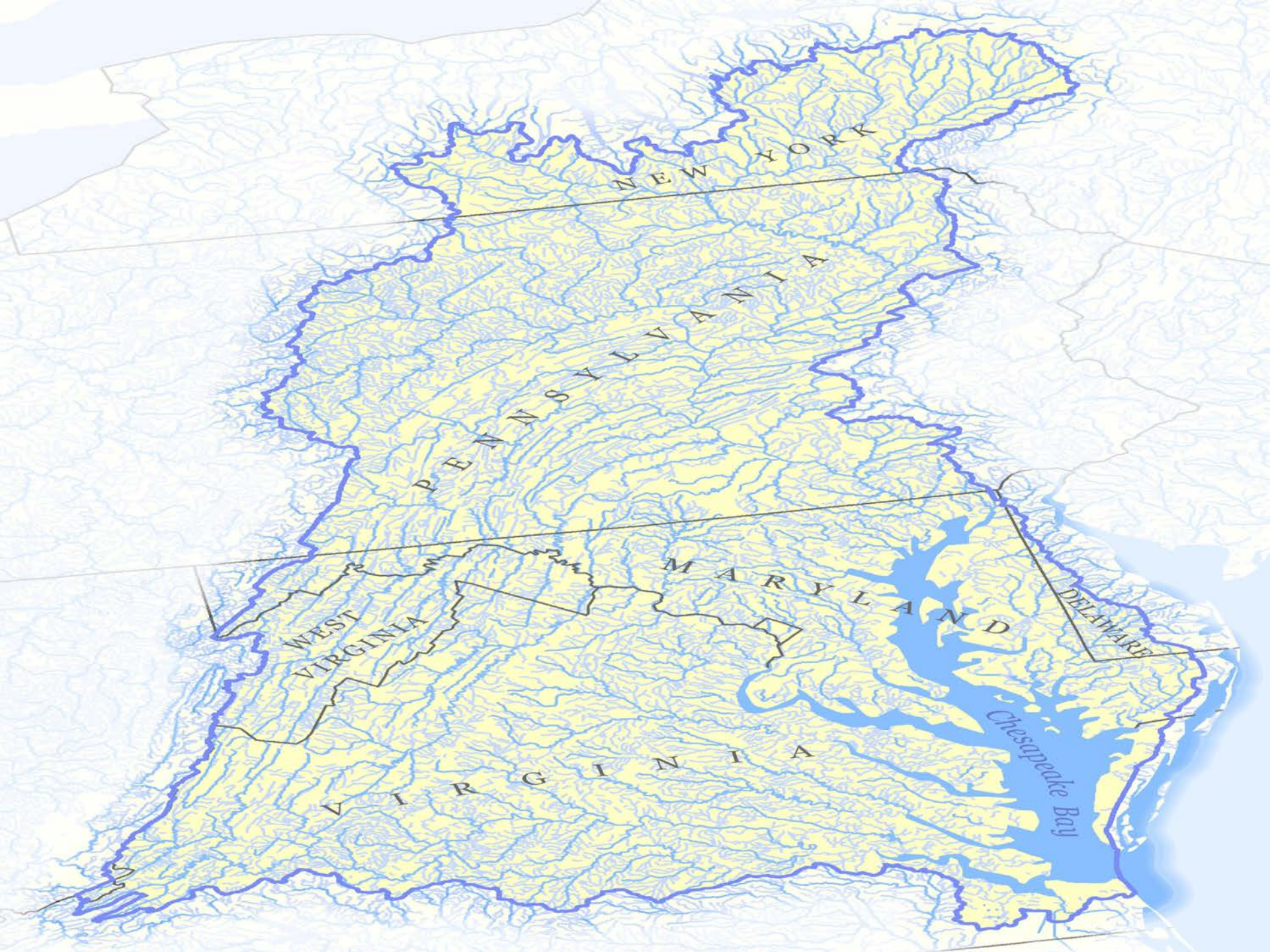
Huge holes in regulatory infrastructure in Chesapeake Bay

Table 1. Huge holes in the existing regulatory framework to address agricultural nutrient and sediment pollution						
Regulations addressing	**Maryland**	**Virginia**	**Pennsylvania**	**Delaware**	**West Virginia**	**New York**
Cropland erosion and sediment pollution on all acres			✔			
Permits for concentrated animal feeding operations	✔	✔	✔	✔		✔
Manure use by all farms	✔			✔		
Chemical fertilizer use by all farms	✔			✔		
Adoption of all practices listed in the Tributary Strategies						

Perez et al. 2009. Facing Facts in Chesapeake Bay. EWG.

Lessons Learned from Dissertation on Regulating Farmers on Delmarva

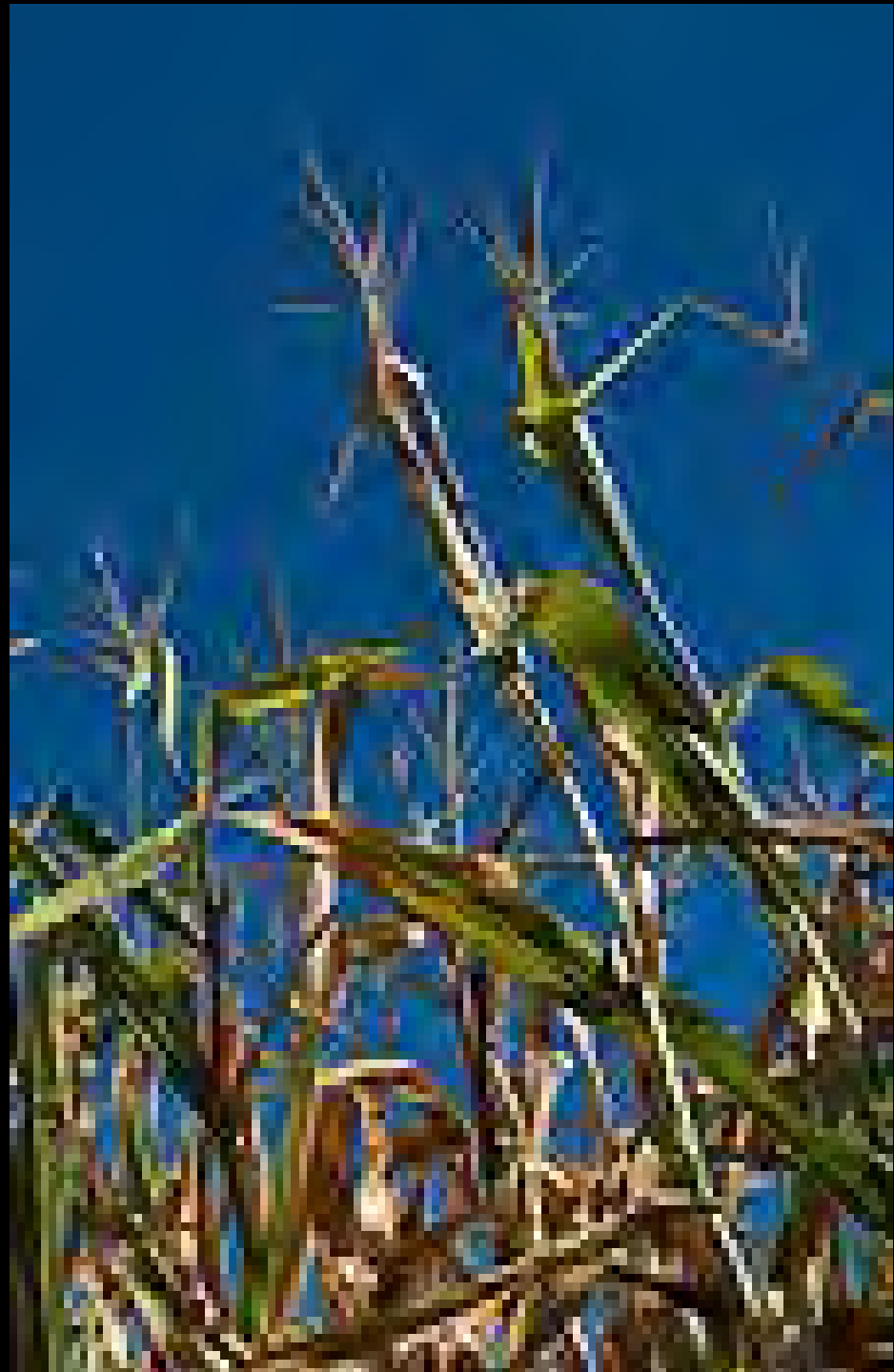


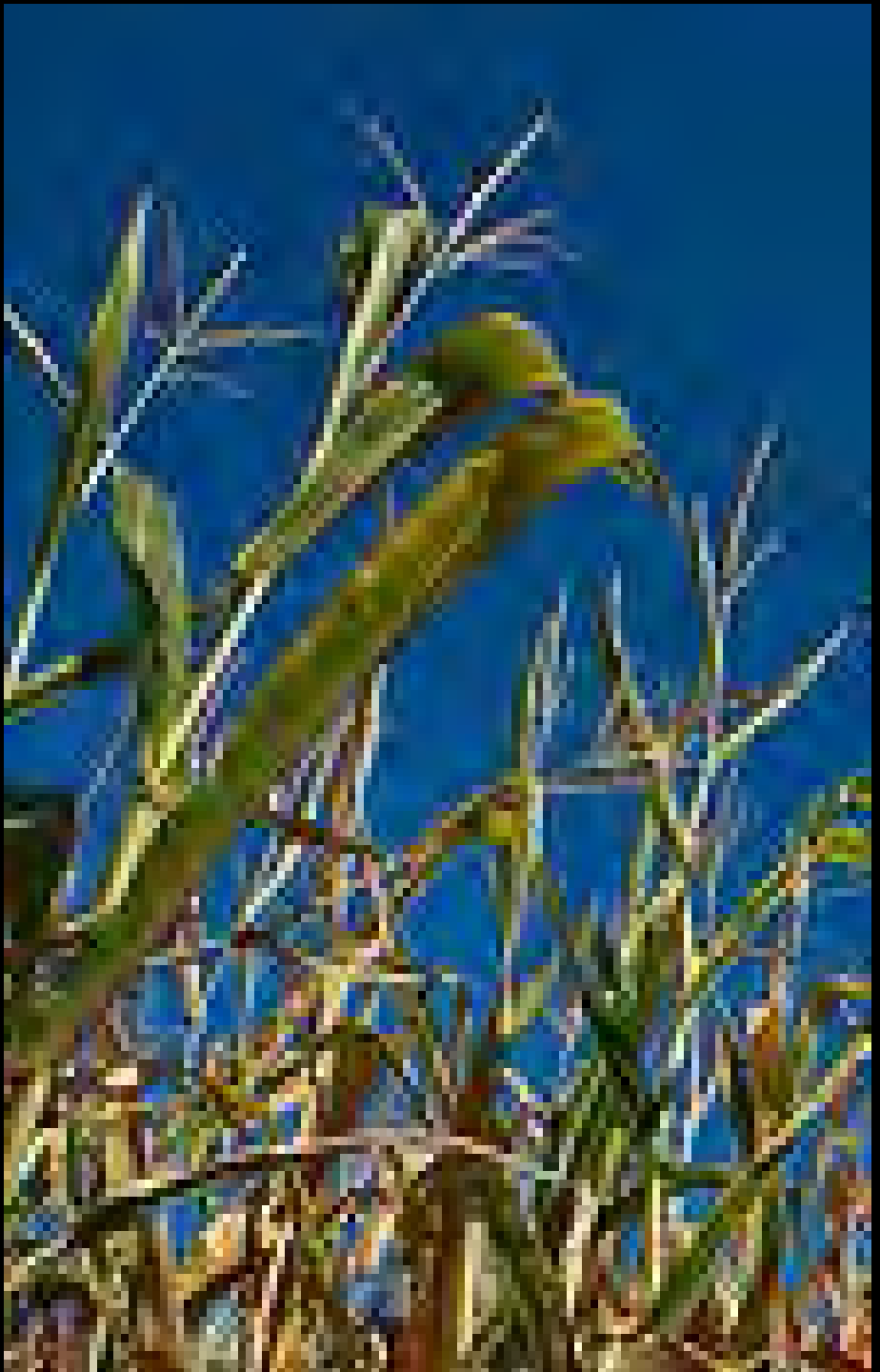

NEW YORK
PENNSYLVANIA
MARYLAND
DELAWARE
WEST VIRGINIA
VIRGINIA
Chesapeake Bay


Cecil
Kent
Queen Anne's
Caroline
Talbot
Dorchester
Wicomico
Somerset
Worcester
Maryland
Kent
Delaware
Virginia

Similarity between states

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





But states didn't define problem or NM Plan solution

- Missed opportunity to quantify:
  - over-application before plan
  - nutrient reduction after plan
  - aggregate ag sector change
- Didn't ask why over-applying w/c might have signaled likelihood of following newly mandated plan

Yes, laws improved practices

- “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

But some farmers aren't following their NM Plan

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

Concerns about some farmers, crop consultants, & fertilizer dealers

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

No, laws have not improved understanding of nutrient science

- About half identify with the old “Maintenance” approach to nutrient application instead of “Sufficiency” concept

- Few agree that soluble P can runoff soils separately from soil erosion

- Only half understand that pre-*phytase* poultry manure rates to meet N needs of corn exceeds corn P need by up to 4 times


Lessons learned
about
regulating
farmers

Plan-based agricultural regulations are, in reality, voluntary


Try agricultural regulations that are meaningful & easier to implement, monitor, & evaluate


Alienating farmers through confrontational regulatory approaches achieves negative outcomes (with certainty)


Gaining “buy-in” from farmers during regulatory policy development likely creates better outcomes (though uncertain)

For any voluntary, quasi-regulatory, market-based, regulatory or combined approach to work, focus effort on narrowing the “gaps” of agreement

So how to achieve local water quality clean-up & Gulf hypoxia goals?

- Don’t delay, ask for help, answers found in a variety of disciplines
- Use all these approaches in innovative combinations & leverage “all” partners
- Borrow and modify models of success from other states
- Fine tune existing watershed-scale projects by partnering with water quality experts
- Think about a “means test” for cost-share so farmers who can prove they can’t afford to be good stewards get the scarce taxpayer dollars


Thank you!
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