

Maryland's Phosphorus Management Tool

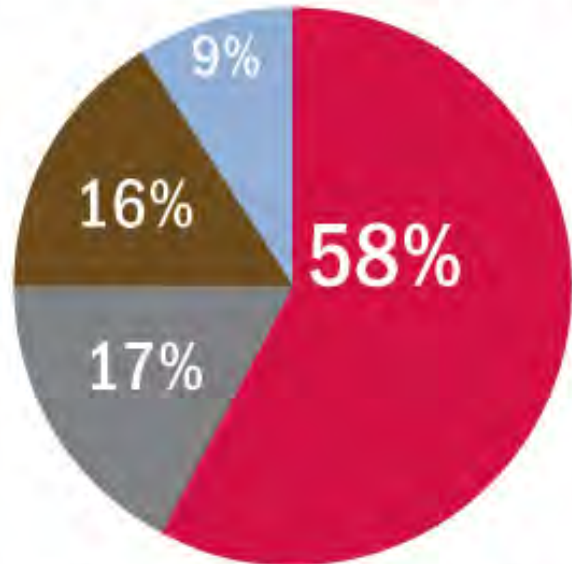
A case study of science trying to become policy

Doug Myers
Maryland Senior Scientist

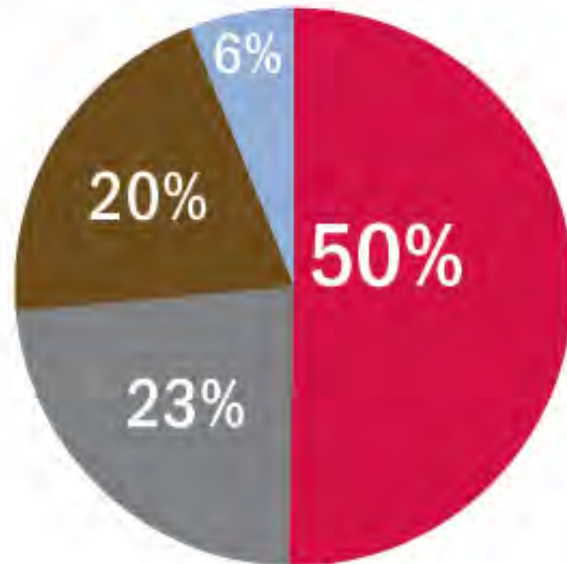


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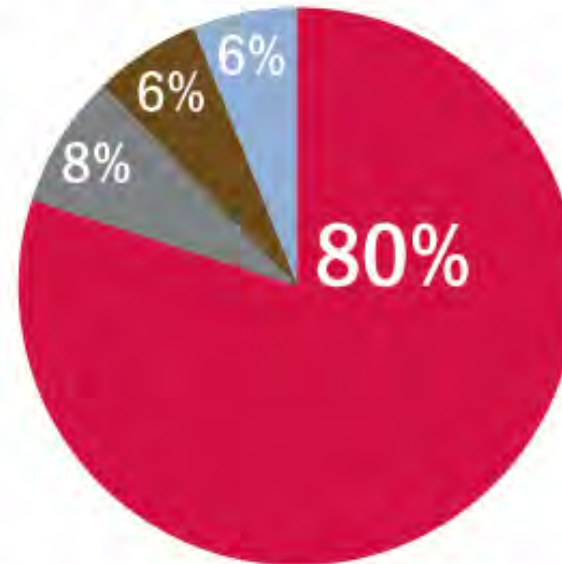
PHOSPHORUS POLLUTION TO THE CHESAPEAKE BAY, BY SOURCE



WATERSHED WIDE



MARYLAND



EASTERN SHORE



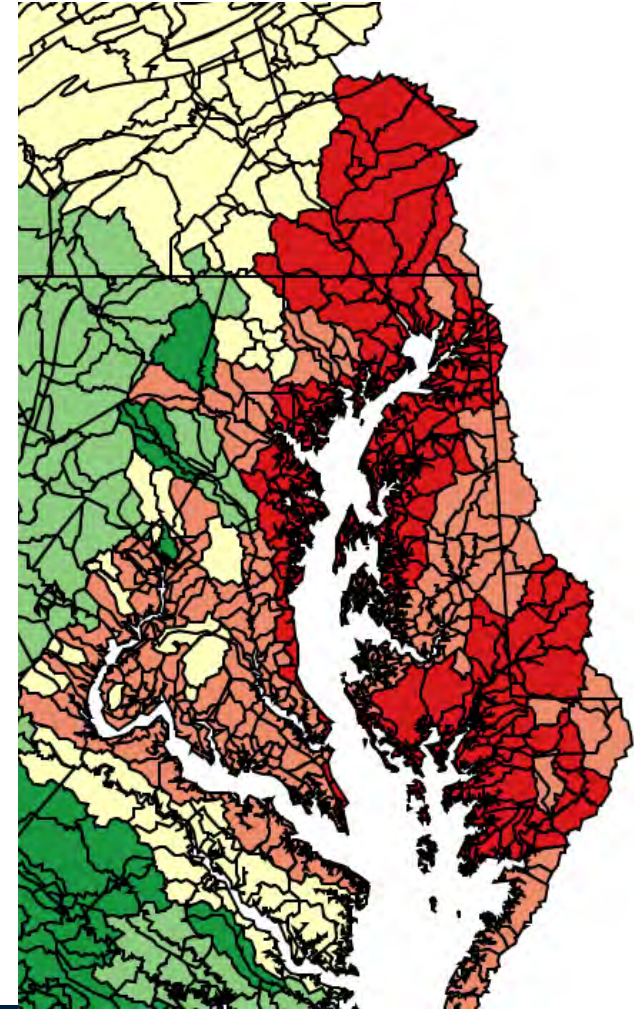
*Chicken Poop and Other Manure and Chemical Fertilizers from Farms

Source: Chesapeake Bay Program Chesapeake Bay Watershed Model 5.3.2

The Problem with Phosphorus



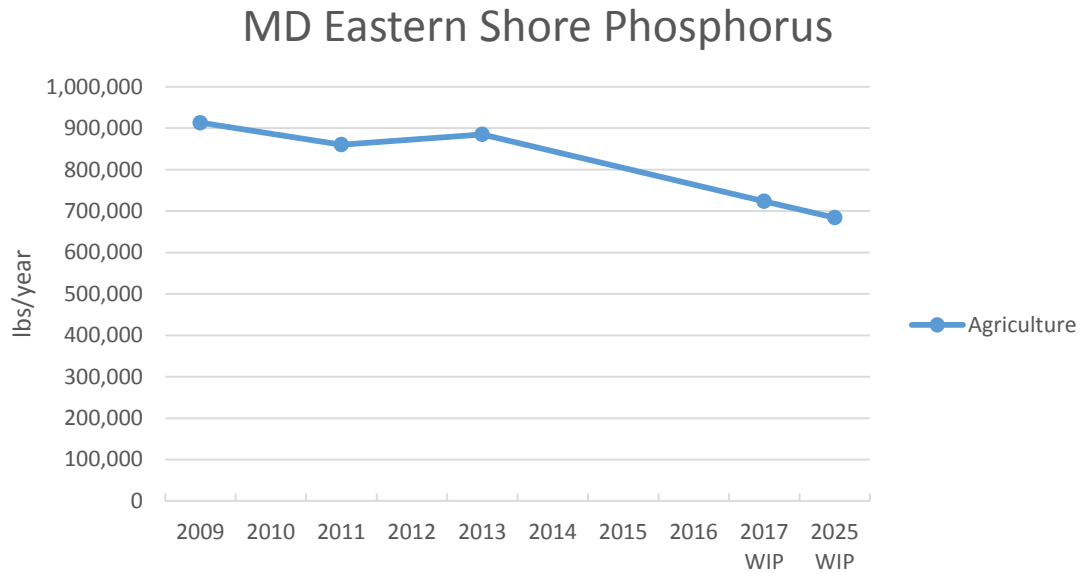
Some parts of the Chesapeake watershed are more susceptible to phosphorus loading regardless of ongoing practice.



Chesapeake Bay Program



The “Other” Problem with Phosphorus



Chesapeake Bay Program

Table 2. Changes in yields of orthophosphorus and total phosphorus at the nine U.S. Geological Survey River Trust Monitoring (RIM) stations during two time periods, long-term (1985–2010) and short-term (2001–10).

RIM STATION	LONG-TERM TREND IN YIELD (1985–2010)		SHORT-TERM TREND IN YIELD (2001–10)	
	ORTHOPIHOSPHORUS	TOTAL PHOSPHORUS	ORTHOPIHOSPHORUS	TOTAL PHOSPHORUS
SUSQUEHANNA	IMPROVING	MINIMAL CHANGE	MINIMAL CHANGE	DEGRADING
POTOMAC	IMPROVING	IMPROVING	IMPROVING	MINIMAL CHANGE
JAMES	IMPROVING	MINIMAL CHANGE	IMPROVING	DEGRADING
RAPPAHANNOCK	IMPROVING	DEGRADING	MINIMAL CHANGE	DEGRADING
APPOMATTOX	IMPROVING	DEGRADING	IMPROVING	DEGRADING
PAMUNKEY	IMPROVING	DEGRADING	IMPROVING	DEGRADING
MATTAPONI	IMPROVING	MINIMAL CHANGE	IMPROVING	MINIMAL CHANGE
PATUXENT	IMPROVING	IMPROVING	IMPROVING	MINIMAL CHANGE
CHOPTANK	DEGRADING	DEGRADING	DEGRADING	DEGRADING

USGS



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Phosphorus Management Tool as Academic Guidance

Scientific and Geographic principles of the tool:

- Spatially explicit at the farm field scale
- Incorporates Bay Model geographic awareness
- Farm practices scenarios
- Soil Phosphorus concentrations
- Calculates risk of phosphorus loss to surface waters

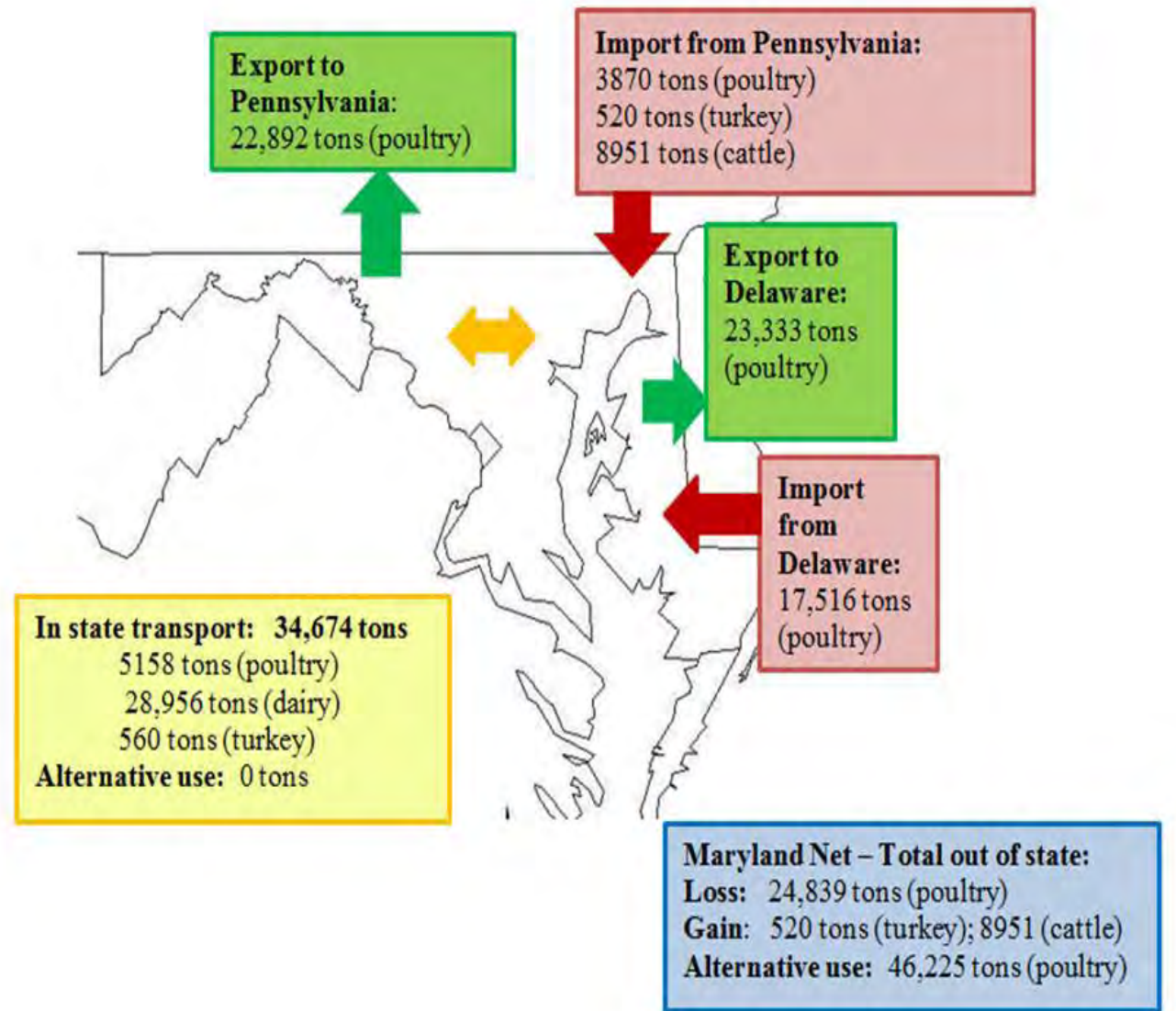


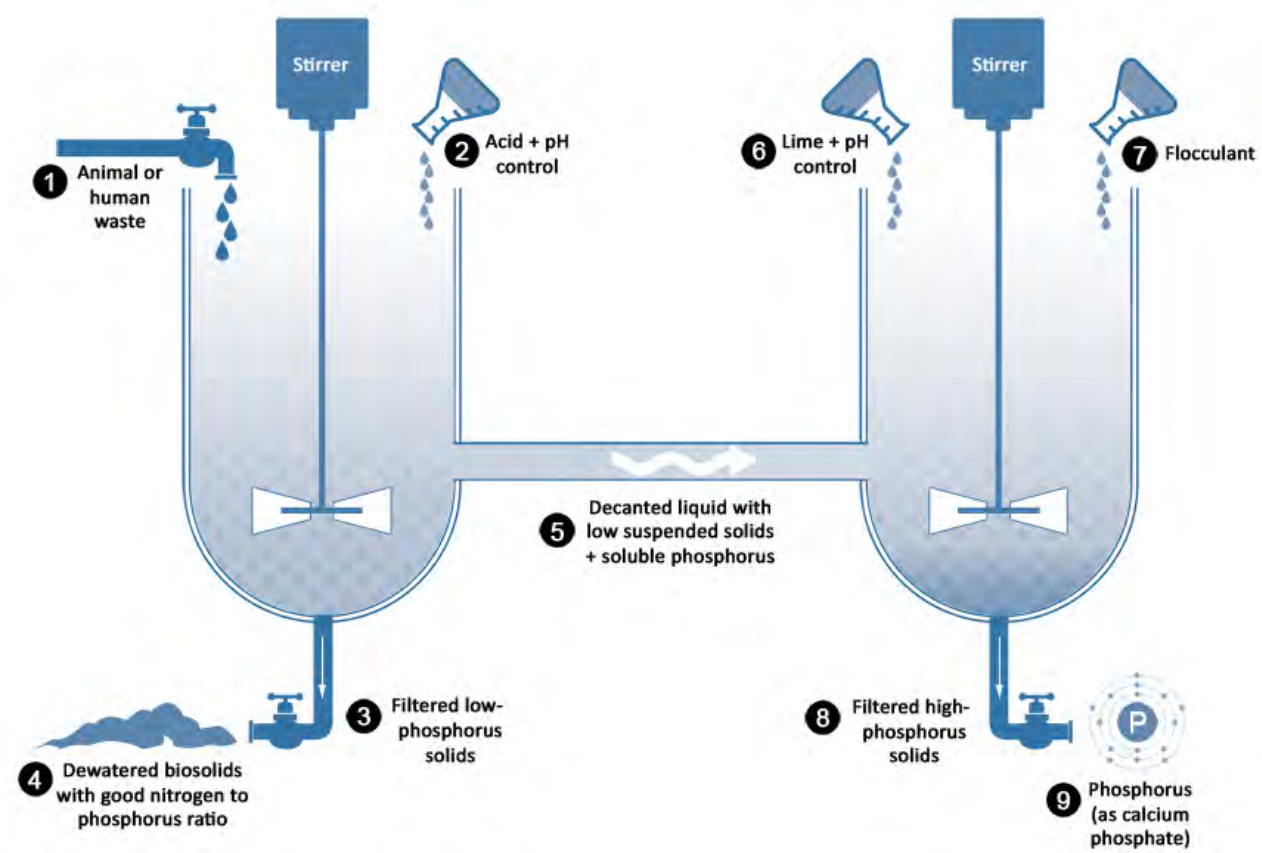
Phosphorus Management Tool as Proposed Regulation

Economic and political considerations of implementing the tool into nutrient management regulations :

- High Risk Farms will need to change fertilization practices
- Chicken Poop will pile up on the Delmarva Peninsula
- Legacy phosphorus will still pollute the bay for decades
- Implementation will cost both farmers and the state money







“Quick Wash” following compost heat exchange – Tria Systems



Biogas digester with centrifugal solids removal

Investments being made in Nutrient Separation Technology



Emphasis on restoring “Soil Health”



Building Blocks:

- Mixed Species Cover Crops
- Soil pH management
- Soil Organic Matter Content





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Questions?