Environmental Issues for the Chesapeake Bay

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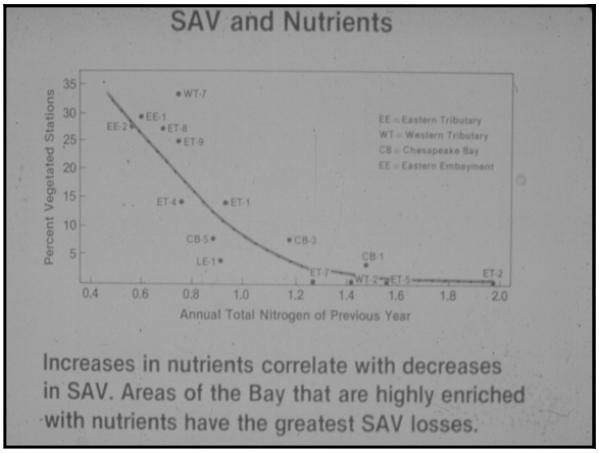
DCR
Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

Chesapeake Bay's Problems

- Congressional appropriation of $27 million for six year EPA study to determine the reasons for the decline of the Chesapeake Bay
- Final report printed in 1982 found three major problems:
- Nitrogen and phosphorus levels causing excess algae growth
- Sediment from ag and urban soil erosion
- Toxic compounds (Ag pesticides not found to be a major problem)

Nitrogen and Phosphorus
Surface Water Concerns

- Algae growth fertilized by nutrients
- As algae die, decomposition process depletes dissolved oxygen needed by fish and other aquatic life
- Extreme cases cause fish kills
- Excessive phytoplankton (algae) growth in Chesapeake Bay cuts out light needed by bottom grasses (S.A.V.)

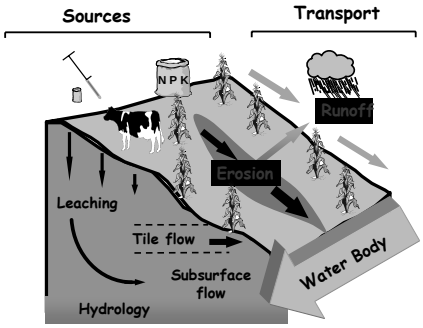


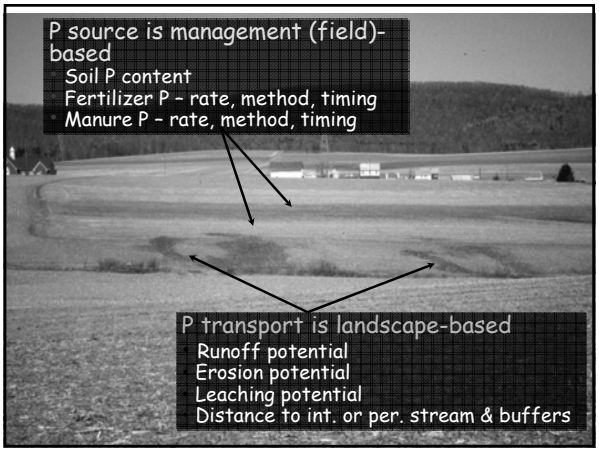
Why Feed Decisions are important to water quality

Nutrient Management Plan

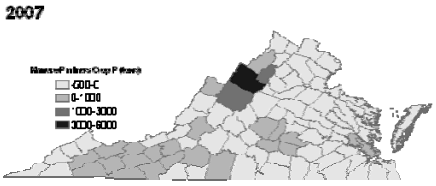
A written document prepared by a Virginia certified nutrient management planner to manage the amount, placement, timing, and application method of manure, fertilizer, biosolids, or other materials containing plant nutrients in order to reduce nutrient loss to the environment and to produce crops.

Nutrients and Water Quality



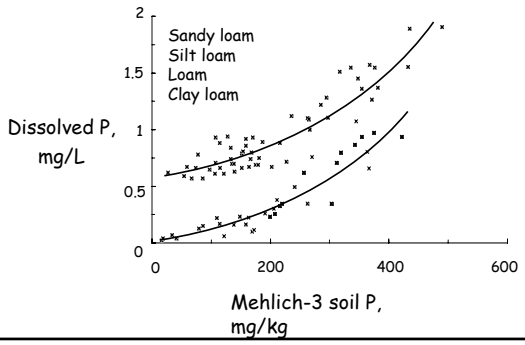


Manure Phosphorus Net Balances in Virginia



Source – MidAtlantic Water Quality Program

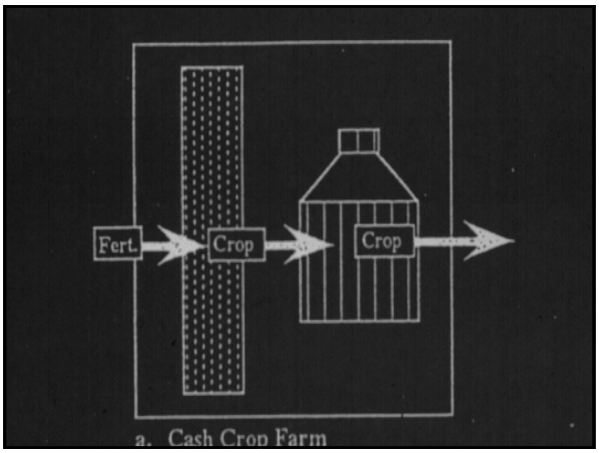
Relating Soil P to Runoff P

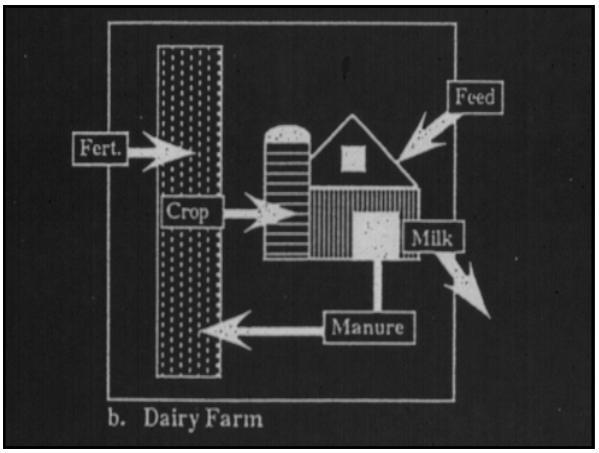


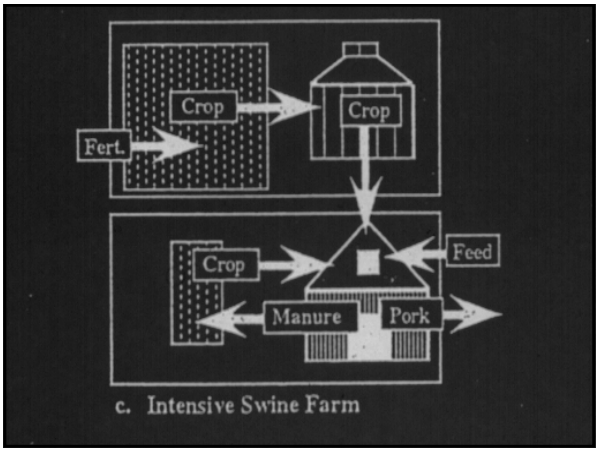
Nutrient Management Phosphorus Criteria

- No P applications regardless of method if soils are greater than 65% phosphorus saturated

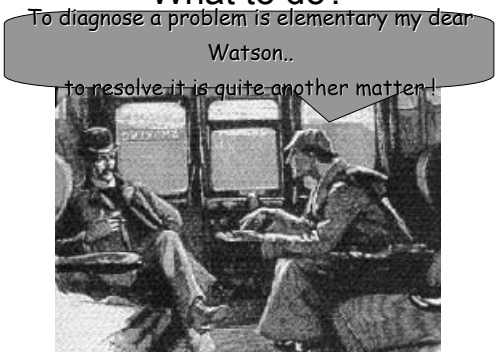
Region	Mehlich I P ppm
Eastern Shore and Lower Coastal Plain	>458
Middle and Upper Coastal Plain and Piedmont	>375
Ridge and Valley	>525







What to do?



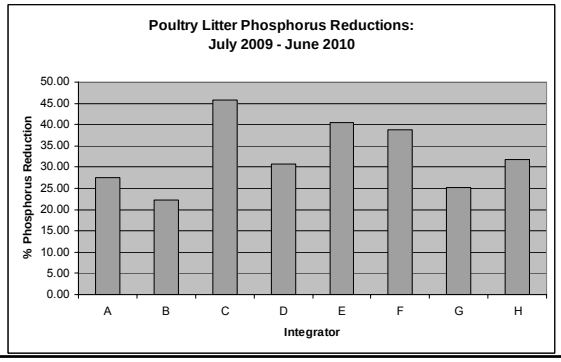
Confined Animals Approaches to feed management to reduce environmental impacts

- Swine
- Poultry
- Dairy

Environmental Feed Management Efforts in Virginia

- 1998-99 Based on work by the late Dr. E. T. Kornegay, Virginia offers matching grants to poultry and swine integrators to install Phytase injection equipment
- 1999 Grant provided to VT Dairy Science Department to research phosphorus management on pilot dairy farms
- 2006 grant to VT Dairy Science Department to implement an innovative pilot incentive program on 300 dairy farms
- 2007 MOAs signed between DCR and six poultry integrators to achieve a 30% P reduction in manures through feed management

Poultry Litter Results to Date



Acres to Meet a P Based Dairy Nutrient Management Plan

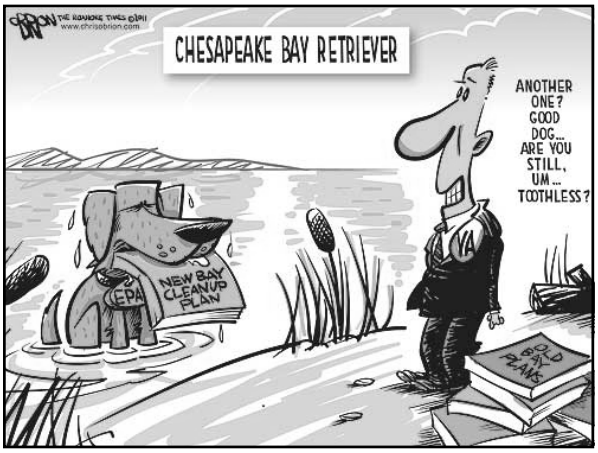
Dietary Phosphorus %	Spreadable Acres/Cow/yr
0.35	1.6
0.38	1.8
0.48	2.4
0.55	2.9

Source: Powell et. al., 2001

Dairy Feeding Considerations

- Nutrient management plan compliance
- Cheap byproduct feeds
- Herd size v. available manure application land

Background on the Chesapeake Bay TMDL



Chesapeake Bay TMDL

- EPA sets pollution diet to meet clean water standards
- Caps on nitrogen, phosphorus and sediment loads for all 6 Bay watershed states and DC
- States and EPA allocate loads to point and non-point sources so not to exceed TMDL cap [i.e., diet]
- Must demonstrate "reasonable assurance" of actions
- VA draft Watershed Implementation Plan (WIP) sent to EPA on Sept 3, final on Nov 29
- EPA published final TMDL on December 29, 2010

Multi-state TMDL

What the Bay TMDL Means to Virginia

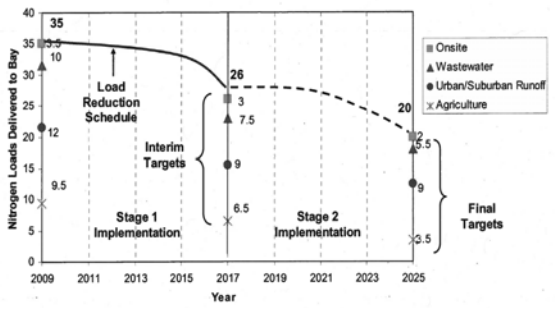
Virginia WIP Allocations
Nitrogen – [Million Pounds/Year]

Sector	2009 Progress	WIP Allocations Nov 29, 2010
Agriculture	21.6	15.4
Urban Stormwater	6.8	6.1
Wastewater	20.0	14.9
Onsite-septic	2.6	2.4
Forest	13.6	14.1
Non-Tidal Deposition	0.6	0.6
VA Totals	65.3	53.4

Virginia WIP Allocations
Phosphorus – [Million Pounds/Year]

Sector	2009 Progress	WIP Allocations Nov 29, 2010
Agriculture	3.08	2.10
Urban Stormwater	1.20	0.99
Wastewater	1.74	1.14
Onsite-septic	0	0
Forest	1.09	1.07
Non-Tidal Deposition	0.06	0.06
VA Totals	7.17	5.36

Example Major Sector Allocations 2017 and 2025



Overview of WIP
Sector Requirements

Overview of WIP
Wastewater

- Significant dischargers will not exceed current allocations based on Water Quality Management Planning Reg and Chesapeake Bay Watershed general Permit Reg
- Plus additional significant N & P reductions in the James and some P reduction in the York
- Nonsignificant discharger loads based on 2005 Code of Va procedures
- Combined sewer systems based on long-term control plan for bacteria

Overview of WIP
Urban Stormwater

- Revise VA Stormwater Management Regulations to prevent loads from increasing above loads allowed for previous land uses.
- Maximize implementation of urban nutrient management:
  - All municipal / county owned lands implement NMPs
  - Lawn service companies follow DCR criteria for fertilizer use and voluntary reporting
  - NMPs on all golf courses
  - Sales restrictions or controls on do-it-yourself fertilizers
  - Prohibit use of nitrogen based deicers
  - Require proper storage and disposal of non-ag fertilizers by retailers

Overview of WIP
Urban Stormwater

- Also install BMPs on existing developed lands to generate reductions beyond urban nutrient management
  - Impervious lands 9% N ↓ , 16% P ↓
  - Pervious lands 6% N ↓ , 7% P ↓
  - Federal Urban Lands – Twice these reductions

Practice Description	% Coverage Existing Urban Impervious Land	% Coverage Existing Pervious Urban Land
Impervious Cover Reduction	7.5 %	-
Filtration Practices	7.5 %	5 %
Infiltration Practices	8.0 %	5 %
Total Area Treated	23 %	10 %

Overview of WIP
Onsite / Septic

- Revisions to Code of VA will be considered to require for all new and replacement systems, the use of either:
  - Shallow-placed drainfields to reduce nitrogen loss, or
  - Denitrification systems (sites where shallow-placed is not an option)
- Seek legislative requirement for 5 year septic pumpout requirements
- Consider Code revision to encourage the use of community systems
- Seek legislation for tax credits or low interest loans to encourage upgrading existing septic systems to nitrogen reducing systems
- Expanded nutrient credit exchange program to offset new systems

Overview of WIP
Agriculture

- Implementation of Resource Management Plans that may include:
  - Nutrient management plans
  - Soil conservation plans
  - Cover crops
  - 35' grass or forest buffers
  - Livestock stream exclusion from perennial streams
  - Assessment of all BMPs in place to determine adequacy
- 95% coverage needed of most of the above practices by 2025.
- Better accounting of voluntary and currently required practices.
- Plus other many practices that reduce nutrients and/or sediment
- Contingencies if Ag milestones not met – request for legislation

Agriculture

Needed BMP Coverage

BMPs	2025 % Treatment
Nutrient Management – Cropland and Hayland	95 %
Conservation Plans – Cropland, Hay and Pasture	95%
35' Grass or Forest Buffers – Cropland and Hayland	95%
Livestock Stream Exclusion Fencing	95%
35' Grass or Forest Buffers – Pasture	30%
Prescribed Grazing	60%
Animal Waste Management Systems	95 %

Agriculture

Needed BMP Coverage

BMPs	2025 % Treatment
Cover Crops – Std Plant	10%
Cover Crops – Early Plant	20%
Commodity Cover Crop – Early Planting	15%
Continuous No-till	60 %
Water Control Structures	1,000 ac.
Precision Agriculture on Cropland	50 %
Container Nursery Greenhouse Runoff and Leachate Collection & Reuse	95%

Agriculture

Needed BMP Coverage

BMPs (partial list)	2025 % Treatment
Poultry Mortality Compost / Incineration / Rendering	100 %
Swine Mortality Compost / Incineration / Rendering	95 %
Poultry Phytase Phosphorus Reductions	30% P Red.
Swine Phytase Phosphorus Reductions	35% P Red.
Non-Urban Stream Restoration	0.22 %
Ag Land Retirement	5 %
Upland Tree Planting	5 %
Wetland Restoration	0.2 %

Agriculture Milestones

% of Ag reductions to be met during milestone periods

- Ending 2011: 5%
- Ending 2013: 5% + 10% = 15%
- Ending 2015: 5% + 10% + 20% = 35%
- Ending 2017: 5% + 10% + 20% + 25% = 60%

- If milestone is not met, results in potential legislative requests that may include: mandatory NMPs, soil conservation plans, livestock exclusion, or grass or forest buffers

EPA Comments on 9/3/10 VA Draft WIP

- Agriculture
  - Reasonable assurance not demonstrated adequate to achieve BMP levels – need to describe regulatory and other drivers
  - Need to better address P saturated soils in Shenandoah Valley
  - Consider expanding VPA permit program to small dairies
  - Develop alternative uses of poultry manure with integrators

EPA Final Evaluation of VA's 11/29/10 Phase I Watershed Implementation Plan

- EPA will track compliance with Virginia's agriculture numeric milestones to meet load reductions every 2 years and ensure that appropriate contingency actions are pursued when necessary
- EPA will use its national review of CAFO state technical standards in 2011 and beyond to identify any shortcomings for water quality protection, including phosphorus management

Agency Websites

EPA
http://www.epa.gov/chesapeakebaytmdl/

VA-DCR
http://www.dcr.virginia.gov/sw/baytmdl.shtml

VA-DEQ
http://www.deq.virginia.gov/tmdl/chesapeakebay.html