

# **Agricultural “BMPs”** (Best Management Practices) & **Nutrient Management**

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CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES

# What Is Nonpoint Source Pollution?

- Comes from thousands of diverse sources (agricultural fields, lawns, streets, construction sites, etc.)
- Requires multiple strategies to control
- Mix of voluntary and regulatory
- DCR is the state's lead nonpoint source control agency

# Nonpoint Source Pollutants

- **Nutrients**

- Fertilizers
- Septic systems
- Pet and animal waste
- Yard wastes and debris



- **Sediment (silt, sand, gravel)**

- Construction sites
- Roadways
- Suburban lawns and gardens
- Stream banks



# Nonpoint Source Pollutants

- **Bacteria**

- Septic tanks
- Sewer lines
- Boating waste disposal
- Pet and animal waste



- **Toxic contaminants**

- Oil, grease and gasoline from roadways
- Home, garden and lawn chemicals

# Concept of a “BMP” in Ag

**Historical Focus:** control topsoil loss & reduce negative environmental impact of farm production practices

- “Dust Bowl” days (1930’s topsoil loss)
- “Science-based” management ideas spread from land grant universities (extension service)
- Protect/improve farm productivity initially

**Now,** on & off farm environmental benefits of on-farm practices; new concepts and technologies

- **Demo/Education** shift to **Implementation** for water quality benefits (still largely voluntary)

# BMPs --The Big Picture

- **Virginia's Ag BMP Manual** – standards & specifications for practices
- Incentive options for farmers vary; 34 BMPs provide a cost-shared or flat-rate incentive payment
- BMP categories:
  - farm management (sidedress application of nitrogen on corn)
  - agronomic practices (permanent vegetative cover on cropland)
  - engineered practices (establishing terraces or building an animal waste control facility)

# Virginia Agricultural BMPs

- Cover Crops
- Continuous No-till System
- Nutrient Management Planning
- Filter Strip
- Riparian Forest Buffer
- Stripcropping Systems
- Livestock Exclusion
- Alternative Water System
- Stream Protection
- Stream Crossing & Hardened Access
- Animal Waste Control Facility
- Sinkhole Protection
- Loafing Lot Management System
- Permanent Vegetative Cover of Critical Areas

# BMPs -- Financial Incentives

Options available to farmers supported by the Commonwealth:

- **Funding Assistance** (VA Ag. BMP Cost-Share Program; CREP)
- **Tax credits** (Virginia State Tax)
- **Loan Programs** (Va. Ag BMP Loan Program- SRLF; Va Small Business Environmental Compliance Assistance Fund)



# BMPs -- Federal Program (NRCS)

**Federal sources** originate from national farm bills (2008 is most recent) and programs that deliver them...

- **EQIP** (Environmental Quality Incentive Program) provided > \$10 million in Ag BMP assistance to Virginia farmers in 2007
- Focus on management systems for production and environmental concerns (state has WQ focus)
- VA divided into 4 services areas (state uses watersheds)
- Federal funding limits higher than state program
- National rules guide federal programs across all states; Virginia program “meshes” to enhance WQ practices

# **BMPs -- Partnership for Delivery**

**Virginia's Ag BMP Program delivery relies upon local-state-federal-private support and delivery system:**

- **Virginia's 47 Soil and Water Conservation Districts** promote cost-share program to farmers, give technical assistance, manage cost-share \$'s under contracts with DCR, comply with program delivery requirements per §10.1-546.1; >100 technical district staff statewide
- **DCR** establishes targeting of \$'s with geographic and practice priorities, distributes funds to SWCDs, provide tracking & reporting system, audits SWCDs, training support, overall program administration.
- **NRCS** provides engineering expertise, field staff, training, practice standards & specifications (plus delivers their own EQIP BMP program)
- **Agricultural Producers** install and maintain practices and provides balance of funding according to practice requirements

**Note: even with incentive options available, farmers often implement BMPs solely on their own initiative (and expense) due to agronomics or their stewardship ethic.**



# BMP Efficiency/Effectiveness

- Farm environmental issues (need driven)
- Applying new technology
- Calculating pollution reduction efficiencies and estimating costs for reductions is a recent phenomena
- Commonly feasible practices
- Cost effective & agronomic benefit
- Reduce inputs and capture excess
- Target pollutants (nitrogen, phosphorus, sediment, bacteria)

# 5 Priority Ag BMPs

Virginia adopted a strategy to promote 5 well accepted and effective practices:

1. Cover Crops
  2. Conservation Tillage (no-till)
  3. Development and Implementation of Nutrient Management Plans
  4. Riparian (streamside) Buffers
  5. Livestock Exclusion (livestock watering systems/streamside fencing)
- **Full implementation of these 5 priority practices achieves 60% of the Bay NPS goal from all land uses**
  - **90% of ag acres in Bay need BMPs to meet goals (current status varies by practice, roughly 30-40% overall)**



# Ag. BMP Incentive Programs – Issues, Future Directions and Needs

- **Targeting** BMP funds, technical staff and outreach efforts will continue to maximize improvements in water quality: DCR has adopted targeted “priority practice” strategy
- **Cost-effective practices** will continue to be a high priority (nutrient reduction per dollar is high for most Ag. practices)
- **Funding fluctuation**; recent farmer research confirms this is the greatest deterrent to farmer participation in the Ag BMP Cost-Share Program
- **Insufficient funding** to meet voluntary demand results in farmers being turned away after sign-up, also a deterrent
- **Short-term and renewed annually BMPs**, unlike upgrades at wastewater treatment plants which, if installed and operated correctly, are “permanent infrastructure”.

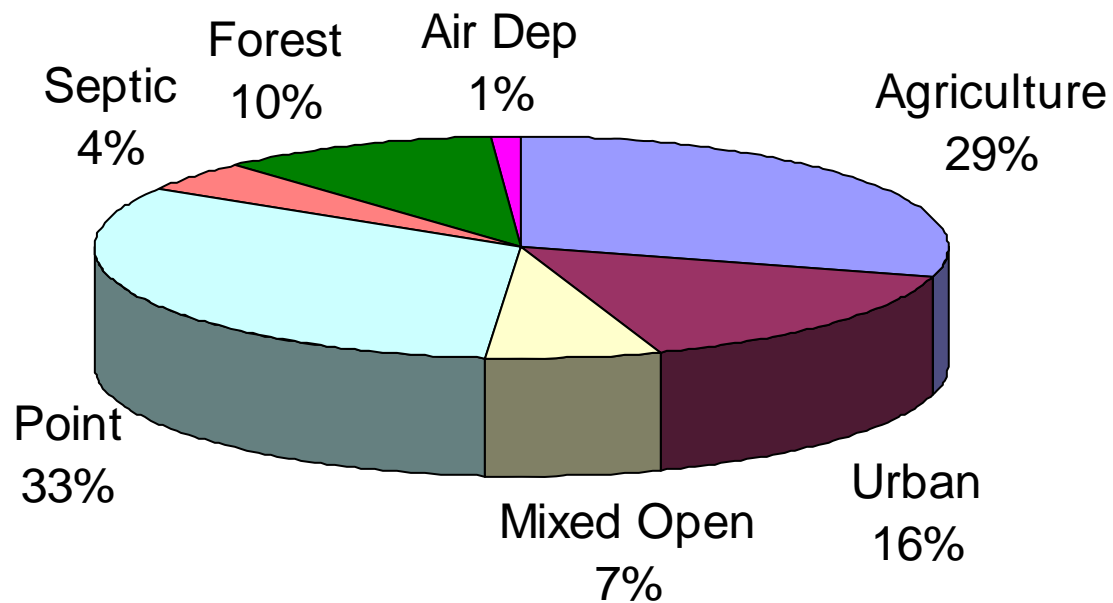


# Issues, Future Directions and Needs (continued)

- **Exclusive Ag. BMP funding:** GA Action in 2008 created a “subfund” to be used with all 2008 appropriation deposited in it; Will funding for urban NPS controls be provided?
- **Greater outreach and promotion** necessary to achieve participation levels voluntarily, little funding.
- **Support and technical assistance needed (Districts, DCR and NRCS)** each relies upon the other
- **Emerging issues: bio-fuels; high input costs & fluctuating crop prices;** could impact farmers desire to keep or take lands out of production
- **Impacts of climate change** on BMP design and efficiencies are unknown.

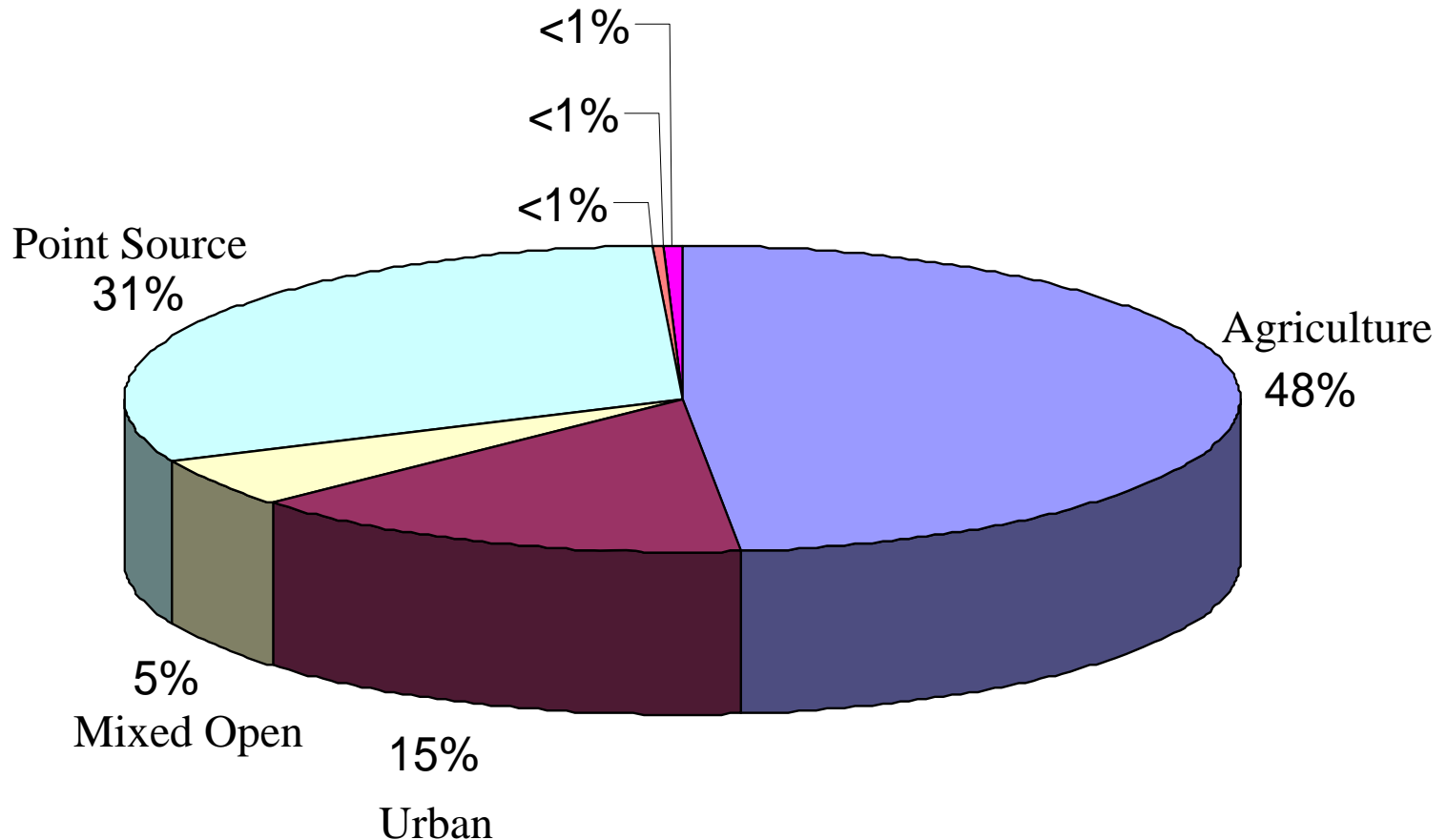


## Virginia's Relative Nitrogen Loadings by Source



■ Agriculture ■ Urban ■ Mixed Open ■ Point ■ Septic ■ Forest ■ Air Dep

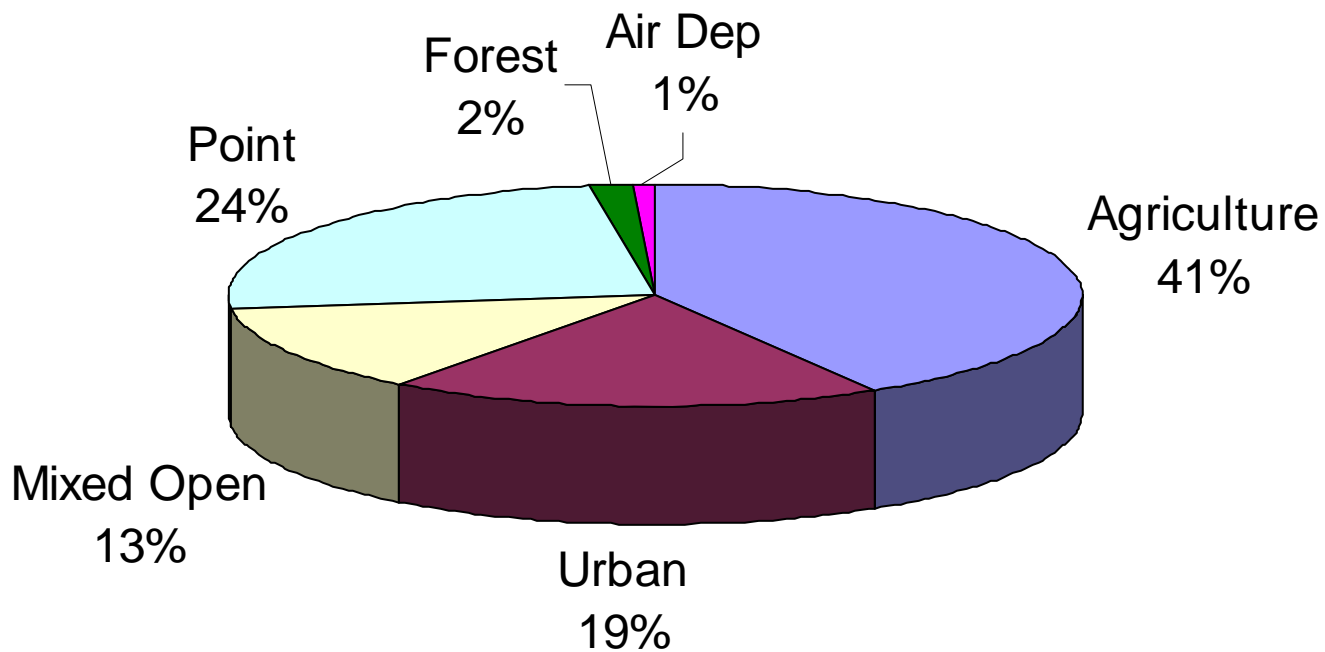
# Virginia Tributary Strategy Total Relative Nitrogen Reductions by Source



■ Agriculture ■ Urban ■ Mixed Open ■ Point ■ Septic ■ Forest ■ Air Dep

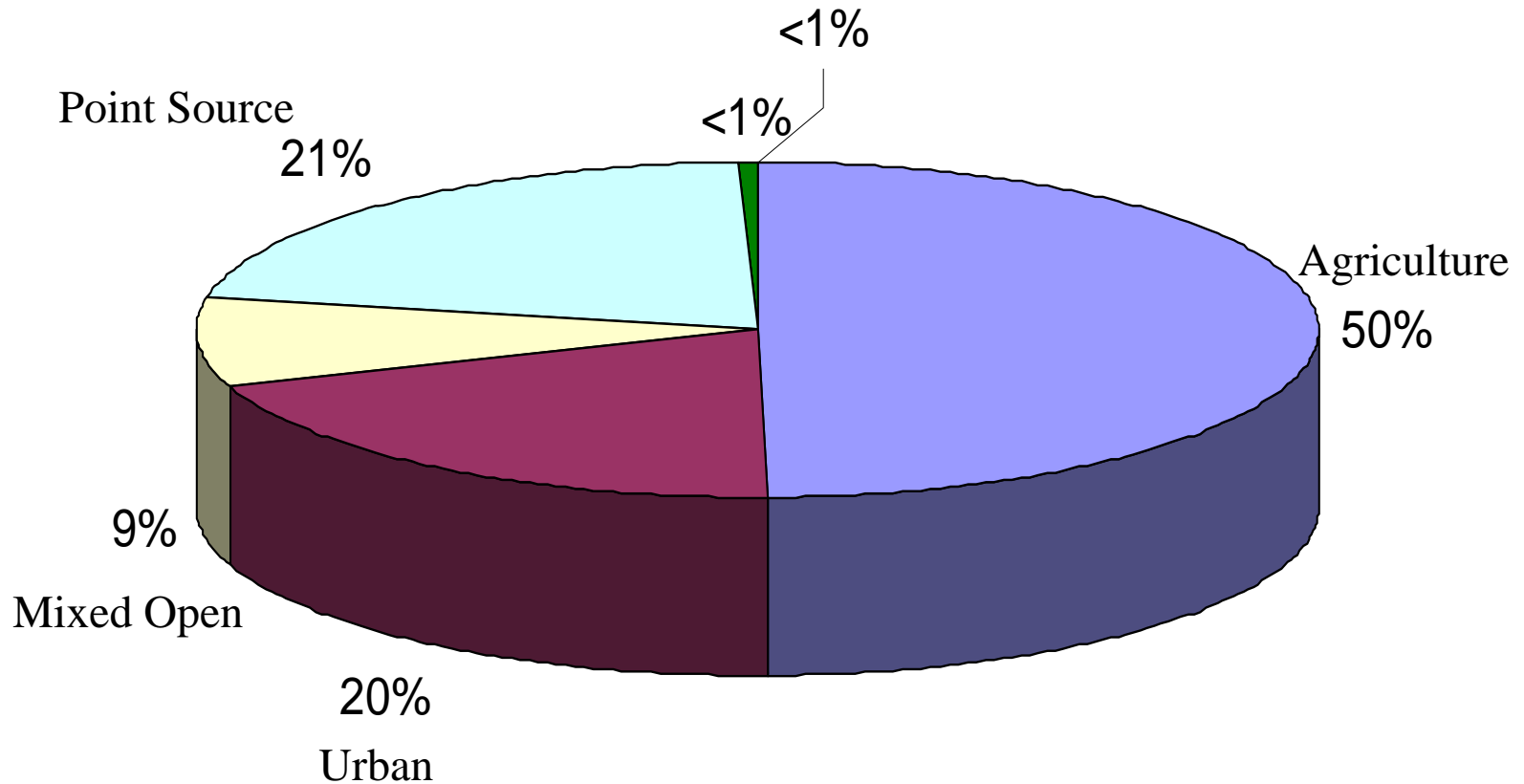


## Virginia's Relative Phosphorus Loadings by Source



■ Agriculture ■ Urban ■ Mixed Open ■ Point ■ Forest ■ Air Dep

# Virginia Tributary Strategy Total Relative Phosphorus Reductions by Source



Legend: Agriculture (light blue), Urban (maroon), Mixed Open (yellow), Point (cyan), Forest (green), Air Dep (magenta)

# Virginia's Nonpoint Needs (best estimates)

	<u>State Share of Cost</u>
<b>CHESAPEAKE BAY and TRIBUTARIES</b>	
Implement Agricultural Best Management Practices (BMPs) through Cost-Share, including 5 Priority Practices (per Tributary Strategies)	\$580 Million*
Implement BMPs on non-agricultural lands	\$660 Million
<b>SOUTHERN RIVERS and TRIBUTARIES</b>	
Implement BMPs for 400 stream and river clean-up plans (TMDLs- \$2.47 M per impairment)	\$989 Million
<b>TOTAL STATE NPS COST</b>	<b>\$2.23 Billion</b>

\* Additional farmer share ~ \$290 M and federal share ~\$45 M

# History of WQIF Funding: Nonpoint Source

Funding has been unpredictable and dependent upon state surpluses and year-end contributions to the Water Quality Improvement Fund – Nonpoint account.

- FY 02 – **No funding**
- FY 03 – **No funding**
- FY 04 – **No funding**
- FY 05 – \$ 9.4 M
- FY 06 – \$ 69.7 M
- FY 07 – \$ 3.8 M  
(2007 caboose bill)
- FY 08 – **No funding**
- FY 09 - \$ 20 M
- FY 10 – **No funding**

## WQIF Allocation by DCR

\$ **59.1 M** - 5 Priority BMPs

\$ **14.0 M** - Base Ag BMPs

\$ **5.37 M** - CREP BMPs

\$ **2.22 M** - TMDL BMPs

\$ 250,000 - Forestry BMPs

\$ 11.38 M - Matching Grants

\$ **1.0 M** - SWCD tech. delivery

\$ 9.6 M – WQIF Reserve

\$80.7 M of \$102.9 for Ag BMPs



# VA Nutrient Management Planning (NMP) Program: *Purpose*

- Encourage proper land application and efficient use of **nitrogen** and **phosphorus** plant nutrients in fertilizers, manures, sewage sludges, etc.
- Applies to agricultural and urban nutrient uses in ways that protect and improve the quality of Virginia's ground and surface waters.



# Virginia Programs Involving Nutrient Management Planning

- **Nutrient management training and certification** – Criteria for certifying planners and technical standards for NMP writing
- **PERMITS:**
  - **Confined Animal Feeding Operation permits** – VA law requires 300+ animal unit dairy, hog and beef operations to have general permits (DEQ) and NMPs (>200 operations)
  - **Poultry Waste Management permits** – VA law requires poultry growers to have general permits and NMPs (940 growers)
  - **Biosolids Land Application permits** – VA law requires all application sites to have NMPs ( >1,000 plans for 150,000 acres)
- **All State-owned Lands** if nutrients applied must have NMP (227)
- **C-S Program** - 20 Ag BMPs in require NMP (100's)

# Available Resources

- 15 DCR field Ag nutrient mgt. specialists (14 are federally funded)
- 1 Urban nutrient management specialist
- NM certification program (316 certified planners; 75 actually write plans)
- “NutMan” 3.0 software for plan development
- DCR provides free manure testing (2 per farm) – 1000 samples/yr
- Cost-share incentives to promote plan writing and implementation

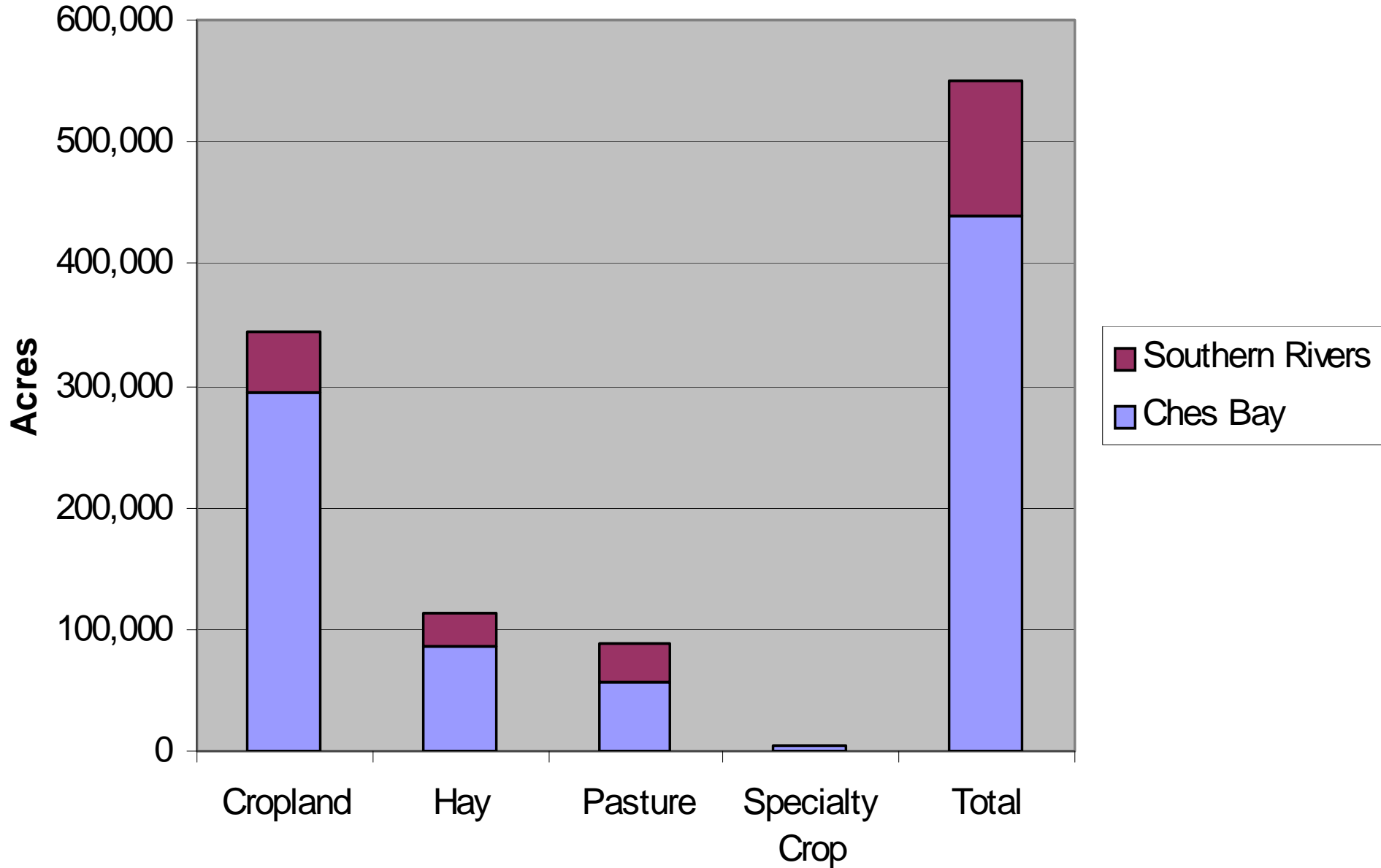
# State Nutrient Mgt Plan Incentives

- **NM1** - Plan development cost to hire a private certified planner - \$6 to 9/acre for 3 year NMP
- **NM2** – Incentive to implement NMP and keep records (available to voluntary operators only) - \$3/acre per yr
- **NM3 & 3B** - Split applied fertilizer N on corn - \$6/acre
- **NM4** - Split application of late winter/spring N to small grain - \$4.50/acre

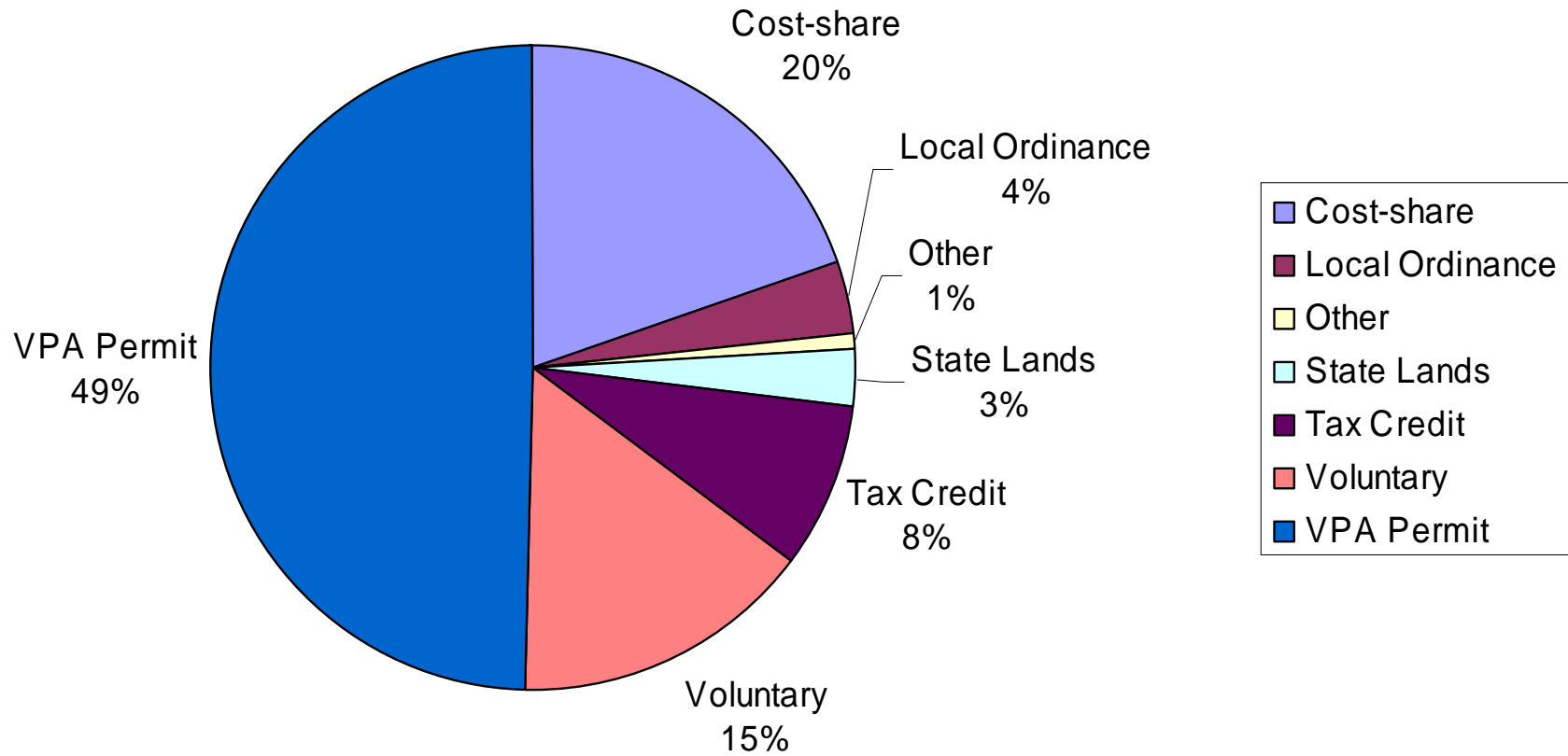
Supporting Incentive: State 25% Income Tax Credit for purchase of precision nutrient and pesticide application equipment



# Current Nutrient Management Plan Acres



# NMPs Developed by DCR Staff by Reason Requested 2004-2007



# Urban Nutrient Management

- ✓ Lawn service agreements; >80
- ✓ Chesapeake Bay Program agreement with Scotts and Lebanon Seaboard – reduced phosphorus by 50%
- ✓ DCR urban nutrient management certification- *being developed*
- ✓ VDACS fertilizer applicator competency - *TAC now forming*



# DCR Nutrient Management Goals

- Achieve 80% level of NMP implementation on cropland in Chesapeake Bay watershed receiving any nutrient source and all hay and pasture receiving organic nutrient sources by December 31, 2010.
- Reduce regional phosphorus imbalances from manure by providing incentives to move poultry litter to areas of crop need.
- Utilize MOUs with poultry and swine industries to reduce P in manure by 30%; continue implementation of dairy feeding incentive project.
- Increase urban nutrient management efforts such as a new category of nutrient management certification.

# Nutrient Management Issues

1. **Flexibility in Making Changes:** Can DCR allow operational changes to occur w/in the NMP and plan writer to make 2-3 changes to an existing plan before needing DCR re-approval.

## **DCR Response:**

- Since May 2006, special conditions for VPAs (livestock and poultry) inserted to authorize certified planner that developed original plan to make certain changes without DCR approval
- Allow common plan amendments involving changes to the cropping system, crop rotations, specific application fields, manure analysis results or minor fluctuations in animal numbers
- Major changes that can impact nutrient loads need pre-approval
- Will be incorporated as 3-year plans are revised

# Nutrient Management Issues

**2. Length/Complexity of Plans:** Can DCR develop a NMP summary to assist farmers to know better what's in the plan?

## **DCR Response:**

- Prototype “nutrient application summary” of only a few pages was developed and presented to NM advisory committee December 2007.
- Summary has been programmed into NutMan software used by many plan writers.
- DCR field staff are now using the summary at front of new plans.
- Guidance to private plan writers to utilize the summary.

# Nutrient Management Issues

**3. Nutrient Plan “Lite”:** Can DCR develop a streamlined, less comprehensive plan? How simple can Virginia make plans and get credit in Bay Model?

## **DCR Response:**

- Streamlining underway. NMP for cash grain farmers have less plan requirements when only using commercial fertilizers.
- Too early to know if the EPA will accept simpler plans for credit in the Bay efforts – still working with modelers.
- Maryland and Delaware require many more agricultural operations to have NMPs than Virginia; many of these may be operations using only commercial fertilizer. DCR is reviewing what they require of simpler farming operations.

# Nutrient Management Issues

**4. Program Administration:** A concern was expressed that DCR central office approval held up plan completion & implementation.

## **DCR Response:**

- State law requires DCR to approve certain NMPs relating to confined animal and poultry operations, biosolids and state agency lands. Many use high amounts of nutrients, combine use of commercial fertilizer and organic waste and therefore require site-specific reviews to protect water quality.
- Cost-share recipients that have NMP requirements do not require DCR approval of NMP.
- Vast majority of complete NM plans (97%) coming to Richmond are approved within 2 weeks of receipt.
- DCR central approval benefits consistency across our regional offices; content oversight, quality control, central database, mailings, etc.



# Summary

## Current Conditions of Ag BMP Cost-share Program

- Implementation is voluntary
- Willing farmers are being turned away
- Inadequate cost-share funding
- Annually fluctuating cost-share funding
- Technical assistance is limiting
- Increased BMP delivery will require increased technical assistance capacity