Beyond BMPs
Achieving Environmental Protection and Economic Gain

Marel King, Pennsylvania Director, Chesapeake Bay Commission
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Our Streams are Unhealthy
What are the factors?

- Nutrients
- Salinity
- Pesticides
- Toxic Sediments
Alteration is Not Inevitable

**Agriculture**

- Altered: 21%
- Unaltered: 79%

**Urban**

- Altered: 11%
- Unaltered: 89%
BMPs Work

Alternative Crops
Animal Waste Management System
Barnyard Runoff Control
Biofilters
Commodity Cover Crop
Conservation Till
Continuous No Till
Cover Crop Early
Cover Crop Late Drilled Rye
Cover Crop Standard
Cropland Irrigation Management
Dairy Manure Injection
Dairy Precision Feeding and/or Forage Management
Decision Agriculture
Dirt & Gravel Road Erosion & Sediment Control
Enhanced Nutrient Management
Forest Buffers
Grass Buffers; Vegetated Open Channel
Horse Pasture Management
Irrigation Water Capture Reuse
Lagoon Covers
Land Retirement to hay without nutrients (HEL)
Land Retirement to pasture (HEL)
Loafing Lot Management
Mortality Composters
No Till allowing combinations with other practices
Non Urban Stream Restoration
Non Urban Stream Restoration (interim)
Nutrient Management
Off Stream Watering Without Fencing
Poultry Litter Injection
Poultry Litter Treatment (alum, for example)
Poultry Phytase
Precision Intensive Rotational Grazing
Prescribed Grazing
Shoreline Erosion Control
Soil Conservation and Water Quality Plans
Sorbing Materials in Ag Ditches
Stream Access Control with Fencing
Streamside Forest Buffers
Streamside Grass Buffers
Streamside Wetland Restoration
Swine Phytase
Tree Planting/Vegetative Environmental Buffers
Wetland Restoration
BMPs provide “Reasonable Assurance”
CHALLENGE:
BMPs must be counted
CHALLENGE: BMPs need acres
CHALLENGE: BMPs need funding
CHALLENGE:
BMPs cannot achieve 100%
SOLUTION?
Manure to Energy
Peak Phosphorus?

Manure to Energy

CHALLENGES

- Multiple funding streams required
- Regulatory obstacles
- Low demand
SOLUTION? 
Biofuels

Watershed Delivered Load to Bay, Millions of lbs. N/y
Biofuels

CHALLENGES

- Infrastructure
- Demand
SOLUTION?

Ecosystem Service Credits

Potential Cost Savings (%) from Nutrient Credit Trading

Savings expressed as a percent of TMDL compliance costs for significant point sources with no trading, except for the last column, where the savings are expressed as the percent of TMDL compliance costs for significant point sources and urban stormwater sources combined.

<table>
<thead>
<tr>
<th></th>
<th>In-Basin-State</th>
<th>In-State</th>
<th>In-Basin</th>
<th>Watershed-wide</th>
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</thead>
<tbody>
<tr>
<td>No Trading</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
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<tr>
<td>Significant PS Trading Only</td>
<td>20%</td>
<td>24%</td>
<td>21%</td>
<td>28%</td>
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<tr>
<td>Significant PS + Agricultural NPS Trading</td>
<td>36%</td>
<td>37%</td>
<td>44%</td>
<td>49%</td>
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<tr>
<td>Significant PS + Agricultural NPS + Urban SW Trading</td>
<td>79%</td>
<td>79%</td>
<td>81%</td>
<td>82%</td>
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</tbody>
</table>

Increasing Trading Sources
Ecosystem Service Credits

CHALLENGES

- Quantifying the credit
- Creating demand
Conclusion

- BMPs will continue to be an important tool
- Additionally, more systemic change will be needed
- Implementation must have economic value
Thank You

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Chesapeake Bay Commission
Policy for the Bay