The Bay Bank

An Ecosystem Services Marketplace for the Chesapeake Region

Introduction to Environmental Law Institute's Baseline Analysis

The Pinchot Institute for Conservation commissioned the Environmental Law Institute to review policies and programs that could influence the development of markets for carbon sequestration, nutrient trading, forest mitigation, wetland mitigation, and conservation/biodiversity banking. Their analysis considered policies and programs that exist or are pending at the national, regional, and state level. Additionally, ELI identified the top ten conservation easement programs in the Chesapeake Bay region.

Their research is a detailed survey of the factors that may help drive demand for services provided by landowners in the Chesapeake region. It is intended to help inform outreach and discussion with organizations throughout the region who are interested in the Bay Bank. However, we also encourage others to use and reference this information and are providing it for public use.

The USDA Forest Service, Northeastern Area, State and Private Forestry supported this study. When appropriate, please give credit for the work performed by Environmental Law Institute by citing the study. The ELI staff members that contributed to the report are Austin Kane and John Pendergrass.

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Bay Bank Baseline Analysis: Regulatory Drivers of Ecosystem Markets in the Chesapeake Bay

Conducted by **Environmental Law Institute**
for **the Pinchot Institute for Conservation**

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REGULATORY BASELINE FOR THE CARBON MARKET

Regional Greenhouse Gas Initiative

The Regional Greenhouse Gas Initiative (RGGI) is an initiative among Northeastern and Mid-Atlantic states to reduce greenhouse gas emissions. The partner states are developing a strategy to reduce emissions primarily through a multi-state cap and trade program using a market-based emissions trading program for power plants.[1] RGGI aims to stabilize carbon dioxide (CO_2) emissions at current levels in 2009 to early 2015 and then by 2019 reduce emissions by 10 percent.[2] The governors of seven states signed a Memorandum of Understanding (MOU) in 2005 agreeing to implement RGGI. These states include New York and Delaware. All states worked together to develop a Model Rule for RGGI implementation at a state-level in August 2006. Maryland signed on as a participant to RGGI in April 2007.[3]

The Model Rule outlines CO_2 trading program general provisions, permits, compliance, allowance allocations, tracking system, allowance transfers, monitoring and reporting, and offset emission projects.[4]

Climate Registry

All Bay states are members of the Climate Registry.[5]

State Regulatory Baseline

NEW YORK

In December 2006, New York, the state that initiated RGGI, released a pre-proposal draft of New York's rule to implement RGGI for public comment. Much of the pre-proposal draft rule is based on the Model Rule released in August 2006; however, there also are New York-specific provisions. For example, the rule proposes allocating emissions through a transparent, open auction as opposed to the more traditional "giveaway" allocation method. The proposed rule also would allow industrial electricity generators that sell less than 10 percent of their energy to the grid to apply for an exemption by January 2008. Emissions will be capped in 2009 at current levels, which are 64.3 million tons. Power plants also will be able to purchase offset credits from

[1] Regional Greenhouse Gas Initiative, *at* http://www.rggi.org [last accessed Jul. 11, 2007].
[2] Regional Greenhouse Gas Initiative, *Regional Greenhouse Gas Initiative (RGGI) Memorandum of Understanding in Brief, available at* http://www.rggi.org/docs/mou_brief_12_20_05.pdf [last accessed Jul. 11, 2007].
[3] Regional Greenhouse Gas Initiative, *Multi-state RGGI Agreement, at* http://www.rggi.org/agreement.htm [last accessed Jul. 11, 2007].
[4] Regional Greenhouse Gas Initiative Model Rule (Jan. 5, 2007), available at http://www.rggi.org/docs/model_rule_corrected_1_5_07.pdf.
[5] National Association of Clean Air Agencies, *State Greenhouse Gas (GHG) Actions (Jun. 26, 2007), available at* http://www.4cleanair.org/Documents/StateGHGActions-chart.pdf. *See also* www.climateregistry.org.

outside of RGGI states provided that it takes place under the regulatory supervision of a cooperating agency in that state.[6]

Point of Contact
RGGI Contact: Peter Iwanoicz, Climate Change Policy Coordinator, New York State Department of Environmental Conservation
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MARYLAND

Maryland's 2006 Healthy Air Act[7] required the State to join RGGI by June 2007 and to contract with an academic institution to conduct a study to determine if joining RGGI will have an adverse impact on the State's economy, energy supply reliability, and energy costs.[8] The Act also includes provisions that Maryland may withdraw from RGGI by January 2009 if the State determines that there are cost and reliability problems. If the State withdraws it must develop a plan to reduce carbon emissions "that considers the use of Maryland grown, native, warm season grasses as a possible method of reducing carbon emissions." [9] Maryland has not yet developed any regulations to implement RGGI in the State. Maryland's Governor also signed an Executive Order in April 2007 that established the Maryland Climate Change Committee.[10]

Point of Contact
Molla Sarros, Maryland Department of the Environment
(410) 837-4108

DELAWARE

Although Delaware has signed onto RGGI, it has not developed a State rule to legally authorize the program. The state's Air Quality Management Regulations include provisions to prevent CO_2 emissions from stationary generators. However both the regulations and the state's pollution prevention laws do not mention RGGI or a carbon emissions trading program.[11]

Point of Contact
RGGI Contact: Philip Cherry, Director, Policy & Planning, Department of Natural Resources and Environmental Conservation

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[6] New York Department of Environmental Conservation, *Notice of Pre-Proposal of New York's RGGI Rule, at* http://www.dec.ny.gov/regulations/26450.html [last accessed Jul. 11, 2007].
[7] MD. CODE. ANN., ENVIR. § 2-1001 to -1005.
[8] *See* University of Maryland – Center for Integrative Environmental Research, *Economic and Energy Impacts from Maryland's Potential Participation in the Regional Greenhouse Gas Initiative (Jan. 2007), available at* http://www.cier.umd.edu/RGGI/documents/UMD_RGGI_STUDY_FINAL.pdf.
[99] MD. CODE. ANN., ENVIR. § 2-1002(g); Maryland Department of the Environment, *Regional Greenhouse Gas Initiative, at* http://www.mde.state.md.us/Air/RGGI.asp [last accessed Jul. 11, 2007].
[10] Exec. Order No. 01.01.2007.07, *available at* http://www.gov.state.md.us/executiveorders/01.07.07ClimateChange.pdf.
[11] DEL. CODE ANN. tit. 7 § 7801 et seq; DEL. ADMIN. CODE tit. 7 § 1144.

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PENNSYLVANIA

Pennsylvania is observing but not participating in RGGI. The recently introduced House Bill 100 would enact the Greenhouse Gas Reduction Act. It would require a report on the impacts of climate change on Pennsylvania, an inventory of the greenhouse gases emitted in the state to identify trends and major contributors, a baseline of emissions, a voluntary greenhouse gas registry, and a climate change action plan that will include an evaluation of greenhouse gas reduction strategies.[12]

Pennsylvania also is within a month of releasing its comprehensive climate change strategy that will look at all greenhouse gases sources and sinks, not only power plants. The State has been looking at all types of development related to and practical aspects of sequestering carbon, including farming methods.[13]

Point of Contact
Daniel J. Desmond, Deputy Secretary for Office of Energy and Technology Development, Pennsylvania Department of Environmental Protection
(717) 783-0540

RGGI Contact: Joe Sherrick, Air Quality Program Manager, Pennsylvania Department of Environmental Protection
717-772-8944

WASHINGTON, D.C.

The District of Columbia Air Quality Division has compiled a greenhouse gas inventory for the District between 1990 and 2000 and project inventories from 2005 to 2012. Previous District Mayor Anthony Williams also endorsed the U.S. Mayors Climate Protection Agreement that calls on cities to meet or exceed Kyoto Protocol reductions. [14] According to this document, the District is an observer of RGGI, but does not participate because it does not have any major power producing facilities within its jurisdiction. However, the report does call for the District to increase urban forestry initiatives and tree cover in recognition that trees sequester carbon. Finally, the report recommends that the District develop a climate change reduction framework to include "flexible, market-based trading systems such as a national or regional Cap and

[12] Pennsylvania H.B. 110 (2007). Available at http://www.legis.state.pa.us/CFDOCS/Legis/PN/Public/btCheck.cfm?txtType=PDF&sessYr=2007&sessInd=0&billBody=H&billTyp=B&billNbr=0110&pn=0188.
[13] Personal communication with Daniel Desmond, Pennsylvania Department of Environmental Protection (Jul. 13, 2007).
[14] District of Columbia Department of Health, *District of Columbia's Greenhouse Gas Emissions Inventories and Preliminary Projections (Oct. 2005)*, available at http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/DC_GreenHouseGas_Inventory.pdf.

Trade."[15] [Note: Dan Cleverdon believes/ hopes that the District will soon be a participant of RGGI.[16]]

Point of Contact
RGGI Contact: Dan Cleverdon, Technical Advisor, D.C. Public Service Commission
(202) 626-0553 / dcleverdon@psc.dc.gov

VIRGINIA

Virginia's air pollution laws and regulations do not include provisions relating to CO_2 emissions and trading, and it is not a participant or observer of RGGI.[17] The Virginia Department of Environmental Quality (VA DEQ)'s Air Quality State Advisory Board, Greenhouse Gas Working Group released a report in January 2007 that outlines various ways other countries, states, and localities are addressing the problem of greenhouse gas emissions. It also includes options for the state of Virginia to implement to begin addressing climate change.[18] One option included in the report is to evaluate joining and participating in RGGI. The report also discusses cap and trade systems, but it does not include this as a specific option for Virginia.

WEST VIRGINIA

West Virginia's Air Pollution Control Law authorizes emissions trading and banking program for air pollutants to meet the "national ambient air quality standards, the reduction or prevention of hazardous air contaminants or the protection of human health and welfare and the environment from air pollution."[19] It does not explicitly outline for what pollutants the trading program may be designed; however, regulations include provisions for a nitrogen oxides emissions trading program.

[15] *Id.*
[16] Personal communication with Dan Cleverdon, D.C. Public Service Commission (Jul. 12, 2007).
[17] VA. CODE ANN. §§ 10.1-1300 to 10.1-1328; 9 VA. ADMIN. CODE §§ 5 et seq.
[18] Greenhouse Gas Working Group*, Report from the Greenhouse Gas Working Group Of the State Advisory Board on Air Pollution (Jan. 5, 2007), available at* http://www.deq.virginia.gov/air/sab/GHGreport.doc.
[19] W. Va. Code § 22-5-18.

SUMMARY TABLE OF RGGI CARBON TRADING MODEL RULE[20]

Transaction Requirements

All CO2 budget sources and units at the source must have one authorized account representative under the CO2 Budget Trading Program. All participating CO2 budget sources must have the applicable regulatory permit. This permit will outline all applicable trading program guidelines.

Credit allocation, unit of credit, etc.

Allowance Allocation Method: Regulatory agency sets the RGGI State CO2 Budget Trading Program annual base budget for 2009 to 2014. It also sets separate annual base budgets for 2015, 2016, 2017, and 2018. Allocations for 2009 to 2012 must be made by January 1, 2009 and allocations for each year after must be made yearly on January 1.

- General allocations will vary by state, but regulatory agencies will allocate at least 25 percent for a consumer benefit or strategic energy purpose.

- Early reduction CO2 allowances (ERA) may be awarded to sources that reduce CO2 emissions in the early reduction period (2006 to 2008). The regulatory agency will make these calculations.

- Regulatory agencies also may choose to allocate voluntary renewable energy market set-aside allocations and limited industrial exemption set-aside allocation.

All allowances have associated serial numbers for identification purposes.

Allowance calculation: Protocols for ERAs are outlined on page 43 of the Model RGGI Rule.

Unit of Allowances: whole ton increments (any fractional shares of CO2 allowances will be banked until they may be combined with other fractional share to transfer as whole ton increments).

Allowance Duration: Control periods

CO2 Allowance Tracking System:
Compliance Account: Each CO2 budget source has a compliance account into which the regulatory agency records allowances. Each year the regulatory agency will record CO2 allowances and allocation set-asides in the account for the year after the last year for which allowances were previously allocated to the account. Each year (at first for years 2009 to 2012). The authorized representative is responsible for tracking any deductions or transfer of CO2 allowances in the CO2 Allowance Tracking System Account.

Deductions: "The CO2 allowances, other than CO2 offset allowances, are of allocation years that fall within a prior control period or the same control period for which the allowances will be deducted; The CO2 allowances are held in the CO2 budget source's compliance account as of the CO2 allowance transfer deadline for that control period or are transferred into the compliance account by a CO2 allowance transfer correctly submitted for recordation under section XX-7.1 by the CO2

[20] Information taken from the RGGI Model Rule, *see* Regional Greenhouse Gas Initiative, *Public Review Model Rule Draft (Mar. 23, 2006), available at* http://www.rggi.org/docs/public_review_draft_mr.pdf.

	allowance transfer deadline for that control period; For CO2 offset allowances, the number of CO2 offset allowances that are available to be deducted for compliance with a CO2 budget source's CO2 budget emissions limitation for a control period may not exceed the number of tons representing the following percentages of the CO2 budget source's CO2 emissions for that control period, as determined in accordance with Subparts XX-6 and XX-8. Following the recordation, in accordance with section XX-7.2, of CO2 allowance transfers submitted for recordation in the CO2 budget source's compliance account by the CO2 allowance transfer deadline for a control period, the REGULATORY AGENCY or its agent will deduct CO2 allowances available under subdivision (a) of this section to cover the source's CO2 emissions (as determined in accordance with Subpart XX-8) for the control period, as follows: (1) until the amount of CO2 allowances deducted equals the number of tons of total CO2 emissions, less any CO2 emissions attributable to the burning of eligible biomass, determined in accordance with Subpart XX-8 of this Part, from all CO2 budget units at the CO2 budget source for the control period; or (2) if there are insufficient CO2 allowances to complete the deductions in paragraph (b)(1) of this section, until no more CO2 allowances available under subdivision (a) of this section remain in the compliance account." If a source does not have enough allowances in its compliance account to cover three times the number of the source's excess emissions, then the source must immediately transfer sufficient allocations into its compliance account. ***Transfers:*** For sources seeking a recordation of a transfer of allowance credits, its sources authorized representative must submit the transfer to the regulatory agency for the recordation and actual transfer of CO2 allowances from the transferor account to the transferee account. ***Compliance:*** Authorized representatives must submit compliance reports and certifications at intervals determined by states. Compliance report must include if the source complied with CO2 budget emissions limitations, if the monitoring plan has been maintained and accurately reflects the operations of the source, and if all emissions were monitored and accounted for in quarterly monitoring reports. ***Monitoring Requirement:*** All CO2 budget sources and units and their authorized representatives are responsible for complying with monitoring requirements set out in each state's RGGI rule. ***Offset Projects***: Power plants are allowed to use offsets from projects outside the energy sector to offset emissions.
Characterization of buyers and sellers	***Buyers:*** Power plants ***Sellers:*** Power plants, landfills; public or private entities that are implementing afforestation projects; agriculture operations
Geographic extent	Depends on state's RGGI rule. New York says trades may take place within and outside of state.
Flow of capital	Transferor to Allowance Tracking System Account to transferee compliance account (regulated agency carries out transfer)
Transactions	None have taken place.

NEW YORK RGGI REGULATIONS[21]

Transaction Requirements

All CO2 budget source required to have a permit under § 201 must apply for CO_2 budget permit and must operate the budget source and units in compliance with the CO2 budget permit. Prior to receiving this permit or an Allowance Tracking System account, a source must designated an authorized account representative.

Credit allocation, unit of credit, etc.

Base Allowance Budget:
"Except as may be modified in accordance with paragraph 242-1.4(b)(4), the CO_2 Budget Trading Program base budget is 64,310,805 tons, annually for the 2009 through 2014 allocation years…62,703,035 tons, for the 2015 allocation year… 61,095,265 tons for the 2016 allocation year… budget is 59,487,495 tons for the 2017 allocation year…[and] is 57,879,725 tons, annually for the 2018 allocation year and each succeeding allocation year."[22]

Note: The NY DEC will establish an "energy efficiency and clean energy technology account" where it will "allocate the CO_2 Budget Trading Program base budget to best achieve the emissions reduction goals of the CO_2 Budget Trading Program by promoting or rewarding investments in energy efficiency, renewable or non-carbon-emitting technologies, and/or innovative carbon emissions abatement technologies with significant carbon reduction potential."

Allowance Allocation Method: Allowances will be "sold in an open and transparent allowance auction or auctions no later than the 1st day of October of the allocation year."

ERAs will be awarded for reductions in 2006 to 2008.

Unit of Allowances: whole ton increments (2,000 pounds)

Allowance Duration: Control periods.

CO2 Allowance Tracking System
Compliance Account: Each CO2 budget source has a compliance account established by the NY DEC into which the regulatory agency records allowances. All deductions and transfers are recorded here. The authorized account representative is responsible for all submissions to the NYDEC for the account.

General Account: Transfers also can be recorded in this account. Established by the NY DEC at the request of the source.

Deductions: Sources may deduct allowances for emission limitation compliance if the allowances were allocated either the year prior to or the control year in which they will be deducted.[23]

Offsets may only be used to comply with emission limitations if they do "not

[21] Information taken from the New York Department of Environmental Conservations proposed draft RGGI Rule, *see* N.Y. COMP. CODES R. & REGS. §§ 242-1.1 to 242-10.7, *available at* http://www.dec.ny.gov/regulations/36588.html.
[22] N.Y. COMP. CODES R. & REGS. § 242-5.1.
[23] N.Y. COMP. CODES R. & REGS. § 242-6.5.

	exceed the number of tons representing the following percentages of the CO_2 budget source's CO_2 emissions for that control period, as determined in accordance with Subparts 242-6 and 242-8: (i) unless the provisions of subparagraphs (ii) or (iii) of this paragraph apply, 3.3 percent; (ii) if the Department determines that there has been a stage one trigger event, 5 percent; (iii) if the Department determines that there has been a stage two trigger event, 10 percent." [24] Transferred allowances may be used to meet emission limitations if submitted appropriately and before the deadline for the control year in which they will be used.[25] ***Transfers:*** For sources seeking a recordation of a transfer of allowance credits, its authorized account representative must submit the transfer to the NY DEC for recordation and actual transfer of CO2 allowances from the transferor account to the transferee account.[26] ***Compliance:*** "For each control period in which a CO_2 budget source is subject to the CO_2 budget emissions limitation, the CO_2 authorized account representative of the source shall submit to the Department by the March 1 following the relevant control period, a compliance certification report." ***Monitoring Requirement:*** Outlined in 242-8.1 et seq. Includes installation of monitoring systems, certification tests, and collection and reporting of air quality data. ***Offset Projects***: Section 242-10 outlines allowed offset projects. They include: "(i) Landfill methane capture and destruction; (ii) Reduction in emissions of sulfur hexafluoride (SF_6); (iii) Sequestration of carbon due to afforestation; (iv) Reduction or avoidance of CO_2 emissions from natural gas, oil, or propane end-use combustion due to end-use energy efficiency; and (v) Avoided methane emissions from agricultural manure management operations."
Characterization of buyers and sellers	***Buyers:*** Power plants (includes coal-, oil-, and gas-fired generating units) ***Sellers:*** Power plants; landfills; public or private entities that are implementing afforestation projects; agriculture operation.
Geographic extent	Within and outside of state
Flow of capital	Transferor to Allowance Tracking System Account to transferee compliance account (regulated agency carries out transfer)
Transactions	None have taken place.

[24] N.Y. COMP. CODES R. & REGS. § 242-6.5.
[25] N.Y. COMP. CODES R. & REGS. § 242-6.5.
[26] N.Y. COMP. CODES R. & REGS.§ 242-7.1.

POTENTIAL REGULATORY/ POLICY DRIVERS FOR OTHER BAY STATES

Virginia	Air Pollution Control Board Laws and Regulations	VA. CODE ANN. §§ 10.1-1300 to 10.1-1328; 9 VA. ADMIN. CODE §§ 5 et seq.
	Report from the Greenhouse Gas Working Group Of the State Advisory Board on Air Pollution	Greenhouse Gas Working Group, *Report from the Greenhouse Gas Working Group Of the State Advisory Board on Air Pollution (Jan. 5, 2007), available at* http://www.deq.virginia.gov/air/sab/GHGreport.doc.
West Virginia	Air Pollution Control Law	W. Va. Code § 22-5-18
Maryland	Healthy Air Act	MD. CODE. ANN., ENVIR. § 2-1001 to -1005
Pennsylvania	Proposed Greenhouse Gas Reduction Act	Pennsylvania H.B. 110 (2007). Available at http://www.legis.state.pa.us/CFDOCS/Legis/PN/Public/btCheck.cfm?txtType=PDF&sessYr=2007&sessInd=0&billBody=H&billTyp=B&billNbr=0110&pn=0188.
	Pending Climate Change Strategy	
Delaware	Pollution Prevention Act	DEL. CODE ANN. tit. 7 § 7801 et seq.
	Air Quality Management Regulations	DEL. ADMIN. CODE tit. 7 § 1100 et seq.
Washington, D.C.	District of Columbia's Greenhouse Gas Emissions Inventories and Preliminary Projections	District of Columbia Department of Health, *District of Columbia's Greenhouse Gas Emissions Inventories and Preliminary Projections (Oct. 2005)*, available at http://ddoe.dc.gov/ddoe/frames.asp?doc=/ddoe/lib/ddoe/DC_GreenHouseGas_Inventory.pdf.

REGULATORY BASELINE FOR WATER QUALITY TRADING

Federal Regulatory Baseline

Federal Water Pollution Control Act 1972 (Clean Water Act)

The Clean Water Act (CWA) sets forth policy to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters."[27] This Act furthers sets policy that discharge of toxic pollutants in toxic amounts into navigable waters is prohibited, that pollution treatment management plans will be developed, that financial assistance will be available to states for publicly owned treatment facilities, that research will be conducted to find the best technology to limit pollution, and that the actions in the Act to eliminate pollution will be carried out expeditiously. This Act requires control of pollution from both point and non-point sources (NPS). The Environmental Protection Agency is granted the authority to establish comprehensive programs to prevent, reduce, and eliminate pollution and regulate the discharge of pollutants into US waters. However, the Act primarily is carried out through state programs with EPA oversight.[28]

Applicable provisions in the CWA or drivers in CWA programs include National Pollutant Discharge Elimination System (NPDES) permits, water quality standards and designated uses, and Total Maximum Daily Loads (TMDLs).[29]

NPDES permits are issued for point source dischargers and domestic sewage treatment facilities.[30] Regulations cover procedures for states to implement their EPA approved programs, permit conditions, permit application processing procedures, and permit appeal procedures. States may also make their permits more stringent than those of the EPA. Most pollutants covered by NPDES affect freshwater systems; however, some sources of particular importance are the following; concentrated aquatic animal production facilities, aquaculture facilities, and storm water dischargers. These regulations also cover exclusions from the permitting requirement. One of note is pollution from the non-point sources agricultural and silvicultural activities (i.e., storm water runoff from orchards, cultivated crops, pastures, and range lands.)[31] NPDES permits can drive nutrient trading because point sources may purchase credits to meet their permit limits or needs to expand their operations.[32]

Water quality standards are developed to maintain water quality and must define designated uses for waters and how much pollutant may be in the waters while still meeting designated uses.[33] States may develop standards that go beyond EPA standards. Waters that do not meet these

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[27] *See* 33 U.S.C § 1251(a) (2000).
[28] *Id*.
[29] Environmental Law Institute, *National Forum on Synergies Between Water Quality Trading and Wetland Mitigation Banking (2005)*, *available at* http://www.elistore.org/reports_detail.asp?ID=11125.
[30] *See* 33 U.S.C § 1342.
[31] 40 CFR § 122 et seq (2006).
[32] Environmental Law Institute, *National Forum on Synergies Between Water Quality Trading and Wetland Mitigation Banking (2005)*, *available at* http://www.elistore.org/reports_detail.asp?ID=11125.
[33] 33 U.S.C. § 303 (a).

standards are put on the CWA § 303(d) list. [34] Effluent limits for point sources or groups of point sources are established when water quality is not being maintained.[35] Once on this list, total maximum daily loads may be established for the amount of pollutant a water body can assimilate and still meet water quality standards.[36] TMDLs also are a driver for trading "because the TMDL assigns each NPDES permit point source that discharges into the listed water body with a waste load allocation. Wasteload allocations will often be more stringent than current permit limits, triggering the need for greater pollutant controls. TMDL also assign a load to nonpoint sources. As numeric nutrient water quality standards are developed in more states and as nutrient TMDLs are implemented, there will be a potential for trading in many locations around the country."[37]

U.S. Environmental Protection Agency Water Quality Trading Policy

The EPA's 2003 Water Quality Trading Policy promotes and encourages the use of water quality trading to meet water quality standards. The policy is meant to encourage states to develop nutrient and sediment voluntary trading programs to implement TMDLs, decreases costs associated with CWA compliance, encourage voluntary nutrient reductions, and promote watershed-level protection strategies and programs.[38] In making decisions related to trading, EPA will do so on a case-by-case basis. EPA will support trading, when specific criteria are met, including:

1. Achieves early reductions and progress towards water quality standards pending development of TMDLs for impaired waters.
2. Reduces the cost of implementing TMDLs through greater efficiency and flexible approaches.
3. Establishes economic incentives for voluntary pollutant reductions from point and nonpoint sources within a watershed.
4. Reduces the cost of compliance with water quality-based requirements.
5. Offsets new or increased discharges resulting from growth in order to maintain levels of water quality that support all designated uses.
6. Achieves greater environmental benefits than those under existing regulatory programs. EPA supports the creation of water quality trading credits in ways that achieve ancillary environmental benefits beyond the required reductions in specific pollutant loads, such as the creation and restoration of wetlands, floodplains and wildlife and/or waterfowl habitat.
7. Secures long-term improvements in water quality through the purchase and retirement of credits by any entity.
8. Combines ecological services to achieve multiple environmental and economic benefits, such as wetland restoration or the implementation of management practices that improve water quality and habitat.[39]

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[34] Environmental Law Institute, *National Forum on Synergies Between Water Quality Trading and Wetland Mitigation Banking (2005)*, *available at* http://www.elistore.org/reports_detail.asp?ID=11125.
[35] 33 U.S.C. § 302 (a)
[36] 33 U.S.C. § 303 (d)(1)(C); Environmental Law Institute, *National Forum on Synergies Between Water Quality Trading and Wetland Mitigation Banking (2005)*, *available at* http://www.elistore.org/reports_detail.asp?ID=11125.
[37] Environmental Law Institute, *National Forum on Synergies Between Water Quality Trading and Wetland Mitigation Banking (2005)*, *available at* http://www.elistore.org/reports_detail.asp?ID=11125.
[38] U.S. Environmental Protection Agency, *Water Quality Trading Policy (Jan. 13, 2003)*, 2, *available at* http://www.epa.gov/owow/watershed/trading/finalpolicy2003.pdf.
[39] U.S. Environmental Protection Agency, *Water Quality Trading Policy (Jan. 13, 2003)*, 3, *available at* http://www.epa.gov/owow/watershed/trading/finalpolicy2003.pdf.

The policy also includes guidelines on trading areas (within a watershed or defined area where a TMDL is approved), pollutants traded (phosphorus, nitrogen, sediment, and possibly others on a case-by-case basis), baseline for water quality trading (reductions beyond those required by regulations or TMDLs), when trading may occur (to maintain WQS, pre-TMDL trading, TMDL trading, technology-based trading, pretreatment trading, and intra-plant trading), alignment with the CWA, elements of credible trading programs, and EPA's oversight role.[40] The EPA currently is working on a revised version of its water quality trading policy. The EPA also developed the *Water Quality Trading Assessment Handbook* [41] to help dischargers determine when and where water quality trading is appropriate for them and if it will work in their watershed.

U.S. Environmental Protection Agency and U.S. Department of Agriculture Agreement

The U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) and the EPA Office of Water signed a partnership agreement in October 2006 to promote a working relationship between the two agencies to collaborate on establishing water quality trading programs. The agreement sets five goals for the agencies:

1. To express mutual commitment to water quality credit trading;
2. To coordinate related agency programs and activities;
3. To support the establishment of water quality credit trading standards;
4. To explore barriers to water quality credit trading and ways to overcome them; and
5. To support a water quality credit trading pilot in a watershed within the Chesapeake Bay basin.[42]

The primary purpose of the agreement is to ensure that agriculture credits are credible and verifiable so that they can be used to offset discharges from industrial and municipal facilities. It also calls for coordinating policies and activities as well as adopting common definitions, standards, and measurement protocols between the agencies. The agreement includes several main principles relating to the partnerships. One of which is that collaboration can improve the effectiveness and efficiency of markets as well as decrease costs and conflicts.[43]

State Regulatory Baseline

TRIBUTARY STRATEGIES AND TMDLS

Virginia

[40] U.S. Environmental Protection Agency, *Water Quality Trading Policy (Jan. 13, 2003)*, *4-11*, *available at* http://www.epa.gov/owow/watershed/trading/finalpolicy2003.pdf.
[41] U.S. Environmental Protection Agency, *Water Quality Trading Assessment Handbook: Can Water Quality Trading Enhance Your Watershed's Goals? EPA Report # 841-B-04-001 (Nov. 2004), available at* http://www.epa.gov/owow/watershed/trading/handbook/.
[42] U.S. Environmental Protection Agency, Office of Water and U.S. Department of Agriculture, Natural Resources Conservation Service, Partnership Agreement between the U.S. Department of Agriculture, Natural Resources Conservation Service and the U.S. Environmental Protection Agency, Office of Water (Oct. 13, 2006), *available at* http://www.epa.gov/owow/watershed/trading/mou061013.pdf.
[43] U.S. Environmental Protection Agency, Office of Water and U.S. Department of Agriculture, Natural Resources Conservation Service, Partnership Agreement between the U.S. Department of Agriculture, Natural Resources Conservation Service and the U.S. Environmental Protection Agency, Office of Water (Oct. 13, 2006), *available at* http://www.epa.gov/owow/watershed/trading/mou061013.pdf.

In 2005, Virginia completed its statewide Tributary Strategy and five strategies for each of its watersheds that drain into the Chesapeake Bay. These strategies outline actions that will improve water quality and meet nutrient caps established by the Chesapeake Bay Agreement for nitrogen, phosphorus, and sediment. Tributary strategy caps for point sources have been codified into the State's Water Quality Management Plan Regulations. Virginia has 1,937 river segments that are considered impaired under section 303(d) of the CWA. As of May 2006, the Virginia Department of Environmental Quality (VA DEQ) had developed TMDLs for 344 of these waters. Virginia law requires development of implementation plans for all EPA approved TMDLs.[44] Implementation plans do not necessarily address specific pollutants but water quality across a watershed and include actions such as BMPs to address the water quality problems.[45] The VA DEQ has developed implementation plans for 60 TMDLs and scheduled development of plans for 47 TMDLs.[46]

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West Virginia
West Virginia also completed its Tributary Strategy in 2005. It outlines measures to reduce nutrient pollution by the amounts set out in the Chesapeake Bay Agreement. Although the State has established TMDLs for various waters, the Tributary Strategy is designed to reduce nutrient pollution entering the Chesapeake Bay to avoid designation of TMDLs in the State's waters that flow into the Bay, and the two are not directly related. The West Virginia Department of Environmental Protection (WV DEP) also has no regulations relating to NPS.[47]

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[44] Virginia Department of Environmental Quality, *TMDL Implementation, at* http://www.deq.virginia.gov/tmdl/implement.html [last updated Apr. 19, 2007].
[45] Virginia Department of Environmental Quality, *TMDL Program Six Year Progress Report: 2000 to 2006 (March 2007), available at* http://www.deq.virginia.gov/tmdl/pdf/06prgrpt.pdf.
[46] Virginia Department of Environmental Quality, *Cleaning Up Impaired Waters: TMDL Progress Report (2007), available at* http://www.deq.virginia.gov/tmdl/pdf/06prbook.pdf.
[47] West Virginia Tributary Strategy Stakeholders Working Group, *West Virginia's Potomac Tributary Strategy (Nov. 7, 2005), available at* http://www.wvnet.org/downloads/posted%20nov142005%20WVTS/WV_Potomac_Tributary_Strategy_FINAL.pdf; Personal communication with Dave Montali, West Virginia Department of Environmental Protection (Jul. 20, 2007).

Maryland
Maryland has Tributary Strategies for each of its 10 tributaries that drain into the Chesapeake Bay. Maryland has numerous impaired waters, some of which have TMDLs, while TMDLs are still in development for others. Maryland's Department of the Environment notes that "Maryland's Tributary Strategies are broad implementation plans for achieving and maintaining nutrient allocations for the ten major watersheds that drain to the Chesapeake Bay. These allocations were established through the year-2000 Chesapeake Bay Agreement process. Local governments should actively support development of Tributary Strategy implementation basin plans as an initial phase of Maryland's nutrient TMDL implementation planning process."[48]

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Pennsylvania
Pennsylvania's Tributary Strategy outlines the State's nutrient reduction goal, how to reach the goal, and new management approaches. One way highlighted to reduce future loads are TMDLs. Pennsylvania is a leader in the number of TMDLs developed, and the plan includes a table of TMDLs developed at the time the Strategy was published.[49]

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Delaware
Delaware's Tributary Action Teams are in the process of developing Pollution Control Strategies for of the State's watersheds with TMDLs. The State's TMDLs establish the targets for the Pollution Control Strategies. These strategies will address Delaware's waters that drain into the Chesapeake Bay, because all of Delaware's waters that drain into the Chesapeake Bay are considered impaired and have TMDLs. These strategies contain both regulatory and non-regulatory elements for both point sources and NPS. Regulatory elements relate to wastewater systems, enhanced stormwater systems, and riparian buffers. Compliance with regulatory elements will be enforced by applicable Department of Natural Resources and Environmental Conservation (DNREC) divisions.[50]

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[48] Maryland Department of the Environment, *TMDL Implementation*, *at* http://www.mde.state.md.us/Programs/WaterPrograms/TMDL/implementation/index.asp#trib [last accessed Jul. 18, 2007].
[49] Pennsylvania Department of Environmental Protection, Pennsylvania Chesapeake Bay Tributary Strategy (Dec. 2004), available at http://www.depweb.state.pa.us/chesapeake/lib/chesapeake/pdfs/tribstrategy.pdf.
[50] Personal communication with John Schneider, Department of Natural Resources and Environmental Conservation (Jul. 20, 2007).

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New York
New York has not yet established TMDLs for its impaired waters. Its Tributary Strategy, like the other strategies, is designed to prevent the establishment of TMDLs for the Chesapeake Bay. The strategy outlines strategy levels for addressing nutrient pollution reduction. Level four serves as a placeholder to implementing any TMDLs that may be established. The level four waste water strategies include consideration of trading/ offset schemes to distribute waste load allocations.[51] Agriculture strategies include accounting for an operations nutrient budget, which will be important if a nutrient trading scheme is established.

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Washington, D.C.
Washington, D.C.'s Tributary Strategy has not yet been finalized. Although most of the District's waters are impaired and some TMDLs have been established, most are related to bacteria and PCPs rather than nitrogen, phosphorus, and sediment. As such, the Tributary Strategy does not address the District's TMDLs. The draft strategy does mention water quality trading as one option to address nutrient reductions.[52]

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STATE WATER QUALITY TRADING POLICIES

VIRGINIA

[51] New York Department of Environmental Conservation, *Draft New York State Tributary Strategy for Chesapeake Bay Restoration (May 2007), available at* http://www.dec.ny.gov/docs/water_pdf/cbaystratdraft.pdf.
[52] Personal communication with Shelia Besse, District Department of the Environment (Jul. 23, 2007).

Chesapeake Bay Watershed Nutrient Credit Exchange Program[53]

Background

Governor Mark Warner established the Chesapeake Bay Watershed Nutrient Credit Exchange Program in 2005. The new law authorizes a Watershed General Virginia Pollutant Discharge Elimination System Permit (general permit). The general permit shall:

> control in lieu of technology-based, water quality-based, and best professional judgment, interim or final effluent limitations for total nitrogen and total phosphorus in individual Virginia Pollutant Discharge Elimination System permits for facilities covered by the general permit where the effluent limitations for total nitrogen and total phosphorus in the individual permits are based upon standards, criteria, waste load allocations, policy, or guidance established to restore or protect the water quality and beneficial uses of the Chesapeake Bay or its tidal tributaries.[54]

This general permit will cover both significant and non-significant dischargers (i.e., sewage treatment facilities), and the permit will supersede individual Virginia Pollutant Discharge Elimination System (VPDES) permits for these facilities. Specifically, facilities that discharge 100,000 gallons or equivalent load[55] into tidal waters per day and 500,000 gallons or equivalent load into non-tidal waters per day must register with the VA DEQ for the general permit.[56] New or expanding facilities that discharge 40,000 gallons or equivalent load into tidal or non-tidal waters also must register for the general permit when applying for an individual VPDES permit.[57] The general permit establishes waste load allocations of nitrogen and phosphorous (annual allowed effluent), compliance schedules, compliance plan submittal requirements, monitoring and reporting requirements, and a procedure for modifying the list of facilities covered by the general permit. All facilities covered under this permit will be published in a list available to the public.[58]

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[53] VA. CODE ANN. §§ 62.1-44.19:12 to 62.1-44.19.

[54] VA. CODE ANN. § 62.1-44.19:14A

[55] Equivalent load means:
2,300 pounds per year of total nitrogen or 300 pounds per year of total phosphorus discharged by an industrial facility are considered equivalent to the load discharged from sewage treatment works with a design capacity of 0.04 million gallons per day;
5,700 pounds per year of total nitrogen or 760 pounds per year of total phosphorus discharged by an industrial facility are considered equivalent to the load discharged from sewage treatment works with a design capacity of 0.1 million gallons per day, and
28,500 pounds per year of total nitrogen or 3,800 pounds per year of total phosphorus discharged by an industrial facility are considered equivalent to the load discharged from sewage treatment works with a design capacity of 0.5 million gallons per day. 9 VA. ADMIN. CODE § 25-820-10.

[56] VA. CODE ANN. § 62.1-44.19:14C(5); Maryland School of Public Policy, *A Bigger Bang for the Buck: Offsets and Other Cost-Effective Strategies for Nitrogen Reductions for the Chesapeake Bay (August 2005),* [on file with author]. Additionally, these dischargers have been identified in the Water Quality Management Planning (WQMP) regulations. *See* 9 VA. ADMIN. CODE §§ 25-720-50, 60, 70, 110, 120.

[57] VA. CODE ANN. § 62.1-44.19:14C(5).

[58] VA. CODE ANN. §§ 62.1-44.19:14C(1), (2), (3), (4), (6), (7).

This new permit program allows for nutrient trading to meet waste load allocations.[59] However, before trading could begin, all sewage treatment plants that fall under requirements for this general permit were required to register to obtain the general permit by January 1, 2007. Each facilities' waste load allocations (determined based on Water Quality Management Plan regulations – which codified Virginia's Point Source Chesapeake Bay Tributary Strategy – or total maximum daily loads where established) are contained in their general permits. An owner of more than one facility may apply for an aggregated mass load allocation.[60] Compliance with waste load allocations must be achieved as soon as possible, but no later than 2011.[61]

Prior to trading, all permitted facilities are required to complete and submit compliance plans to the VA DEQ by August 1, 2007 that include how phosphorus and nitrogen reductions will be met by 2011. Plans must include what capital projects are in place to reduce their waste load allocations and implementation schedules for meeting required reductions. Plants that met their allocation loads in 2005 must outline how they will maintain their reduced loads or request that their load allocations become effective on January 2007. If the latter is chosen, then these permitted facilities can generate credits for reducing above this amount.[62] Once these plans are complete and approved, the VA DEQ will be able to determine available credits for the next five years and trading is scheduled to begin in 2008. Construction of new plants is being deferred to ensure there will be a demand for credits into the future. [63]

Trading

Existing sewage treatment plants have the option to meet their waste load allocations by reducing their loads, purchasing compliance credits, or paying into the Water Quality Improvement Fund if no credits are available within the tributary.[64] Existing sewage treatment plants may obtain credits from another permitted point source facility provided that credits are generated and applied in the same calendar year, credits are generated by facilities in the same tributary, credits are acquired no later than June 1 immediately following the calendar year in which the credits are applied, and the credits are generated through design flow or industrial activity.[65]

Expanding facilities' waste load allocations are based on their allowed discharges in the Water Quality Management Plan regulations or their initial design capacity.[66] New facilities

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[59] Waste load allocations are determined based on the Water Quality Management Planning Regulations. *See* 9 VA. ADMIN. CODE § 25-720-50, 60, 70, 110, 120. Regulations for Nutrient Enriched Waters and Dischargers within the Chesapeake Bay Watershed (9 VA. ADMIN. CODE § 25-40-10) and Water Quality Management Planning (WQMP)Regulation (9 VA. ADMIN. CODE § 25-720) outline the point source nutrient reductions required for the Chesapeake Bay watershed. The WQMP regulations Exchanges must account for "delivery factor" for each discharge based on its location in a watershed and using the Chesapeake Bay Program watershed model (9 VA. ADMIN. CODE § 25-720-40A). These regulations identify the total waste loads for significant dischargers per basin

[60] 9 VA. ADMIN. CODE § 25-820-70 Part I B.

[61] 9 VA. ADMIN. CODE § 25-820-70 Part I C.

[62] 9 VA. ADMIN. CODE § 25-820-40.

[63] Personal communication with Kyle Winter, Virginia Department of Environmental Quality (Jul. 2, 2007).

[64] 9 VA. ADMIN. CODE § 25-820-70 Part I J.

[65] 9 VA. ADMIN. CODE § 25-820-70 Part I J.

[66] 9 VA. ADMIN. CODE § 25-820-70 Part II A.

being constructed must have zero discharge. Thus, both new and expanding facilities must acquire credits to offset their additional or new discharges. Offset credits may be acquired through purchase of both or either of the following: (1) all or part of the waste load allocation of another permitted facility based on the "delivered pounds" recorded by the VA DEQ or (2) nonpoint source load allocations based on a trading ratio of two pounds reduced for every pound discharged, using BMPs. Allocations must be:

> (i) Acquired through a public, or private entity acting on behalf of the land owner;
> (ii) Calculated using best management practices efficiency rates and attenuation rates, as established by the latest science and relevant technical information, and approved by the board;
> (iii) Based on appropriate delivery factors, as established by the latest science and relevant technical information, and approved by the board;
> (iv) Demonstrated to have achieved reductions beyond those already required by or funded under federal or state law, or by the Virginia tributaries strategies plans, and
> (v) Included as conditions of the facility's individual Virginia Pollutant Discharge Elimination System permit.[67]

NPS credits may be generated by agriculture or development operations that are implementing best management practices (BMPs).[68] Additionally, BMPs must be included in the NPS discharger's individual VPDES.[69] The purchaser of the offset must ensure that the BMP is implemented and successful.[70] Allocations/ credits also may be acquired through payments to the Water Quality Improvement Fund only when no credits are reasonably available within a tributary.[71] Other means for acquiring credits may be approved on a case by case basis by the VA DEQ.

General permit holders may establish a Virginia Nutrient Credit Exchange Association (Association), a non-stock corporation, for coordination of credit trading among members. The Association may:

> (i) submit on behalf of the permittees the compliance plans required by § 62.1-44.19:14, (ii) develop a standard form of agreement for use by permittees when buying and selling nitrogen and phosphorus allocations and credits,
> (iii) assist permittees in identifying buyers and sellers of nitrogen and phosphorus allocations and credits,
> (iv) coordinate planning to ensure that to the extent possible, sufficient credits are available each year to achieve full compliance with the general permit,
> (v) assist individual municipal permittees in utilizing public-private partnerships and other innovative measures to achieve the Commonwealth's water quality goals, and

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[67] 9 VA. ADMIN. CODE § 25-820-70 Part II B.
[68] "Acquisition of nonpoint source load allocations through the use of best management practices acquired through a public or private entity acting on behalf of the land owner. Such best management practices shall achieve reductions beyond those already required by or funded under federal or state law, or the Virginia tributaries strategies plans, and shall be installed in the same tributary in which the new or expanded facility is located and included as conditions of the facility's individual Virginia Pollutant Discharge Elimination System permit." VA. CODE ANN § 62.1-44.19:15B.
[69] VA. CODE ANN. § 62.1-44.19:15B.
[70] Maryland School of Public Policy, *A Bigger Bang for the Buck: Offsets and Other Cost-Effective Strategies for Nitrogen Reductions for the Chesapeake Bay (August 2005)*, [on file at the Environmental Law Institute].
[71] *Id.*

(vi) perform such other duties and functions as may be necessary to the effective and efficient implementation of the credit exchange program.[72]

The Association may not assume any responsibility for member's compliance with permit conditions. [73]

Monitoring and Verification
Monitoring must be conducted by the permittee on specific weekly schedules outlined in the trading regulations; however, the permittee may monitor more frequently. Monitoring and sampling must be conducted in accordance with methods approved under 40 CFR Part 136 (2006). Other methods must be approved by the Department. Loading values must be calculated and reported to the nearest pound, and data will be recorded and reported in a format determined by the VA DEQ. [74] All permitted facilities also must report to the VA DEQ on their annual nitrogen and phosphorus mass loads and discharges for the previous year and the credits available for purchase or sale. The VA DEQ will then determine and publish the discharges for each facility and the amount of credits available for purchase sale by each facility. [75] The Department also conducts audits to ensure reports and monitoring are complete and accurate.[76]

VA DEQ regulations for the nutrient trading program outline specifics for authorized activities,[77] waste load allocations,[78] compliance with allocations,[79] schedule of compliance,[80] updating compliance plans,[81] monitoring requirements,[82] annual reporting,[83] registration,[84] and public notices.[85] Regulations also outline procedures for new facilities or expanding facilities to purchase offsets from non-point source dischargers.

Summary
Steps for trading:

1) Existing, expanding, and new sewage treatment facilities register for general permit.
2) All facilities must complete compliance plans by August 1, 2007 for trading to begin. Plans will outline how facilities will meet waste load allocations. Plans updated each year.
3) Compliance credits:
    a. Facilities report on annual load and discharge and report to VA DEQ at end of every calendar year – outline if need to buy or sell credits.

[72] VA. CODE ANN. § 62.1-44.19:17A.
[73] VA. CODE ANN. § 62.1-44.19:17A.
[74] 9 VA. ADMIN. CODE § 25-820-70 Part I E.
[75] VA. CODE ANN. §§ 62.1-44.19:18C; 62.1-44.19:18D.
[76] VA. CODE ANN § 62.1-44.19:19.
[77] 9 VA. ADMIN. CODE § 25-820-70 Part I A.
[78] 9 VA. ADMIN. CODE § 25-820-70 Part I B.
[79] 9 VA. ADMIN. CODE § 25-820-70 Part I J.
[80] 9 VA. ADMIN. CODE § 25-820-70 Part I C.
[81] 9 VA. ADMIN. CODE § 25-820-70 Part I D.
[82] 9 VA. ADMIN. CODE § 25-820-70 Part I E.
[83] 9 VA. ADMIN. CODE § 25-820-70 Part I F.
[84] 9 VA. ADMIN. CODE § 25-820-70 Part I G.
[85] 9 VA. ADMIN. CODE § 25-820-70 Part I I.

b. VA DEQ identifies the credits available for purchase and sale and published this list.
c. Facilities have a few months to decide on trades.
d. Trades must be registered with VA DEQ.
e. VA DEQ then verifies that everyone has met their limits.
f. If facilities tried to purchase credit, but there were none available, they may buy credits out of the Water Quality Improvement Fund.

4) Purchasing Offsets: (new and expanding facilities will need to purchase offsets to meet requirements of offsetting all new discharges.)
   a. New or expanding facility will find a partner PS facility from which it can purchase part of its waste load allocation.
      i. New or expanding facility will change its load on its general permit registration and no verification will be needed because the facility selling the credits agrees to reduce discharge.

   Or

   b. New or expanding facility will purchase credits from a NPS that is reducing its load through a BMP or some other means.
      i. The purchasing facility must report transaction to the VA DEQ in July prior to the calendar year that the trade will take place (this gives the VA DEQ time to verify the transaction before it takes place and the agricultural operation or other NPS to implement its nutrient reduction activities.)
      ii. The purchasing facility must provide verification to the VA DEQ that the NPS load reduction was in place the February the following calendar year after the trade took place.
      iii. If for some reason, the load was not reduced enough to offset the purchasing facility's load, then the purchasing facility may purchase compliance credits for the next year.

Chesapeake Bay and Virginia Waters Clean Up Plan

The Secretary of Natural Resources released the *Chesapeake Bay and Virginia Waters Clean Up Plan* in January 2007. The plan outlines various strategies and actions that should be taken to improve water quality throughout the state. In addition to implementing Virginia's nutrient trading program, for developed lands and lands being developed, the plan also recommends establishing jurisdictional nutrient caps for areas within the Chesapeake Bay and implementing a revised stormwater management program. For forestry and agriculture operations, the plan suggests implementing cost-effective best management practices for agricultural lands and "accelerating land conservation efforts."[86]

Point of Contact

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[86] Secretary of Natural Resources, *Chesapeake Bay and Virginia Waters Clean Up Plan (Jan. 2007), available at* http://www.naturalresources.virginia.gov/Initiatives/WaterCleanupPlan/docs/ChesBayVaWatersCleanupPlan0107.pdf.

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WEST VIRGINIA

West Virginia Potomac Water Quality Bank and Trade Program

Water Quality Trading Stakeholders Committee met in 2004 to determine if water quality trading would be a feasible option for West Virginia to decrease NPS pollution. Although consensus was reached on a variety of related-issues, no consensus was reached on whether water quality trading should be developed and implemented in West Virginia. Thus, the report and recommendations of the Committee are not formal or final.[87]

Currently, the West Virginia Water Research Institute, the World Resources Institute, and the Natural Resources Conservation Service are partnering with local, state, and regional stakeholders to develop the West Virginia Potomac Water Quality Bank and Trade Program in order to meet its mandate to reduce phosphorus, nitrogen, and sediment loads into the Bay. The goal of the bank will be to decrease NPS pollution into the Bay, which will be achieved through a market driven system where point source dischargers will be able to offset their discharges by providing funds to help with costs of implementing and maintaining NPS BMPs. WRI's NutrientNet, an electronic platform for trading credits, is being modified to apply to the Potomac River Watershed and will be used for this program. Using NutrientNet will help with transaction costs and make this program applicable to other watersheds within the Bay.[88]

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MARYLAND

Draft Policy on Nutrient Trading

Maryland Department of the Environment currently is in the process of developing a nutrient trading policy. A preliminary draft was released for stakeholder review and the Department is in the process of revising the draft and it will be released in a few months. The policy (MDE has not determined if it will be voluntary or regulatory) will specifically be for point source to point source trades and will include septic systems. The MDE also is working with the Maryland Department of Agriculture to start working on a way to involve nonpoint sources. This policy will be in a separate document.[89]

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[87] *See* West Virginia Department of Environmental Protection, *Water Quality Trading Stakeholders Committee, at* http://www.wvdep.org/Item.cfm?ssid=21&SS1ID=429 [last accessed Jun. 27, 2007].
[88] West Virginia Water Resources Institute, *West Virginia Potomac Water Quality Bank and Trading Program*, *at* http://wvwri.nrcce.wvu.edu/programs/pwqb/index.cfm [last accessed Jun. 21, 2007].
[89] Personal communication with x (get name), Maryland Department of the Environment (Jun. 29, 2007).

PENNSYLVANIA

Final Trading of Nutrient and Sediment Reduction Credits- Policy and Guidelines[90]

Background

The PA DEP issued its Final Trading of Nutrient and Sediment Reduction Credits- Policy and Guidelines for nitrogen, phosphorus, and sediment in November 2006. These policies and guidelines are voluntary and are a means for dischargers to meet regulatory requirements.[91] The guidelines are for point source facilities (e.g., waste water treatment plants) and specific non-point sources (concentrated feed lots and urban and municipal separate storm sewer systems).[92] Trading must be consistent with WQS and TMDLs, where applicable. Credits used to meet a nutrient cap in a NPDES permit must meet permit conditions.[93] Four main principles guide the policies:

> (1) trades must involve comparable credits (e.g. nitrogen must be traded for nitrogen); (2) trades must be expressed as mass per unit time (e.g. pounds per year);
> (3) trades can occur only between eligible parties; and
> (4) credits generated by trading cannot be used to comply with existing technology-based effluent limits except as expressly authorized by federal regulations.[94]

Under these guidelines, the PA DEP establishes "cap load" of total nutrient discharge allowed for all facilities within a watershed. Most NPDES permits will include effluent limits that are associated with these caps. Once these caps are established trades may take place only within watersheds and must conform to water quality standards. Reductions can only be considered credits if the reduction exceeds state or federal requirements.[95]

Trading

To participate in the trading program, both point source and NPS dischargers must meet certain baseline eligibility criteria. The baseline for point sources (e.g., sewage treatment plants, industrial plants) is the more stringent technology-based or water quality based effluent limitation established in NPDES permits, or if a TMDL is established stricter limits may apply. NPS dischargers must meet regulatory requirements to be eligible to generate credits. These requirements vary by NPS (e.g., agricultural operations, on-lot operations, urban stormwater runoff). [96] For example, agricultural operations must meet applicable regulatory requirements[97]

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[90] Pennsylvania Department of Environmental Protection, *Final Trading of Nutrient and Sediment Reduction Credits- Policy and Guidelines, Document # 392-0900-001(Dec. 2006), available at* http://www.depweb.state.pa.us/chesapeake/lib/chesapeake/dec29_2006/finalpolicy_12-28.pdf. Authorities for these guidelines are Pennsylvania Clean Streams Law (35 P.S. §§ 691.1 – 691.1001); Federal Water Pollution Control Act (33 U.S.C.A. §§ 1251 - 1387); 40 CFR Part 122; and 25 PA CODE §§ 92, 93, and 96.

[91] Specific regulatory requirements include Maryland's 2005 Water Quality Standards that PA must meet because its rivers flow into Maryland.

[92] Pennsylvania Department of Environmental Protection, *supra* note 56, 4.

[93] Pennsylvania Department of Environmental Protection, *supra* note 56, 5.

[94] Pennsylvania Department of Environmental Protection, *supra* note 56, 5.

[95] Pennsylvania Department of Environmental Protection, *supra* note 56, 5-6.

[96] Pennsylvania Department of Environmental Protection, *supra* note 56, 6.

to be eligible to participate in the trading program, and may establish BMPs[98] to generate credits, as this action is above and beyond regulatory requirements.[99] Third parties (e.g., aggregators) may also participate in trading.[100] Guidelines also include a process for approving and tracking trades. The PA DEP is responsible for approving, verifying, registering, managing use of credits, and overseeing public participation.[101]

The PA DEP's Implementation Plan for NPDES permitting is not regulatory but provides new guidelines for the Department on cap loads. The Implementation Plan also states that nutrient trading will be encouraged to meet caps for phosphorus and nitrogen in a cost-effective manner.[102]

Trading in the Chesapeake Bay

The PA DEP Policy and Guidelines document includes specific guidelines for trading within the Chesapeake Bay Watershed.[103] These guidelines specify that credits must correspond to a pound of reduction, trades may not be initiated to "comply with existing technology-based effluent limitations," and credits must have a definite time period or shelf life and be accounted for each year. If credits are generated by a BMP that will last over a year, they must be reapproved and reverified each year.[104] Trading can only occur within the same watershed (i.e., the Susquehanna or the Potomac). The PA DEP and conservation districts may certify credits.[105] The guidelines also set specific eligibility baselines[106] and trading thresholds[107] to participate in trading. For point sources, baselines and thresholds are the same: all point sources must meet effluent limits

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[97] Regulatory requirements include those in "Chapter 102 Erosion & Sedimentation Regulations, Section 91.36 (Agricultural Operations), Act 38 Nutrient Management Regulations, and Chapter 92 (Concentrated Animal Feeding Operations).

[98] A source could implement 1 of 24 BMPs established by the Chesapeake Bay Watershed Model and listed in the Pennsylvania Tributary Strategy or similar methods. Additionally, non-structural BMPs such as cover crops, instituted after January 2005, may also generate credits. Pennsylvania Department of Environmental Protection, *Fact Sheet: Nutrient Trading (Feb. 2007), available at* http://www.dep.state.pa.us/river/Nutrient%20Trading_files/Trading%20Fact%20Sheet-%203900-FS-DEP4073.pdf; Pennsylvania Department of Environmental Protection, Pennsylvania Chesapeake Bay Tributary Strategy (Dec. 2004), available at http://www.depweb.state.pa.us/chesapeake/lib/chesapeake/pdfs/tribstrategy.pdf.

[99] Pennsylvania Department of Environmental Protection, *Fact Sheet: Nutrient Trading (Feb. 2007), available at* http://www.dep.state.pa.us/river/Nutrient%20Trading_files/Trading%20Fact%20Sheet-%203900-FS-DEP4073.pdf

[100] Pennsylvania Department of Environmental Protection, *supra* note 56, 6.

[101] Pennsylvania Department of Environmental Protection, *supra* note 56, 7-14.

[102] Pennsylvania Department of Environmental Protection, *Pennsylvania's Chesapeake Bay Tributary Strategy Implementation Plan for NPDES Permitting, at* http://www.depweb.state.pa.us/chesapeake/lib/chesapeake/april2007/implementation_plan_npdes_permitting.pdf [last accessed Jun. 28, 2007].

[103] Pennsylvania Department of Environmental Protection, *Appendix A: Nutrient Trading Criteria Specific for the Chesapeake Bay Watershed, available at* http://www.dep.state.pa.us/river/Nutrient%20Trading%20Documents/Additions%2012-29-2006/Final%20APPENDIX%20A%20_12-28_.pdf.

[104] *Id*. at 2-3.

[105] *Id.* at 4.

[106] Baseline is defined as the "compliance activities and performance standards which must be implemented to meet current environmental laws and regulations for a particular location or facility. This includes allocations established in a TMDL approved by the Department that are specific to a particular source at a defined location." *Id.*at 3.

[107] Trading threshold is defined as the "[l]oading or level of nutrient and sediment reduction efforts to be achieved and maintained before credits can be generated for any additional reductions." *Id,* 5.

in NPDES permits. NPS dischargers also must meet applicable regulatory requirements as outlined in the overall trading policy. Although the baseline for NPS agricultural operations are the same as those listed in the overall trading policy. However, agricultural operations also must meet one of the following thresholds:

- 100 Foot mechanical setback or equivalent; this is achieved when ***ONE*** of the following is met:
  - Manure is not mechanically applied within 100 feet of surface water.
  - There are no surface waters on or within 100 feet of the farm.
  - Farm uses no manure application and applies commercial fertilizer at or below the Penn State recommended agronomic rates.
- 35 Foot buffer or equivalent; this is achieved when all of the following are met:
  - A minimum of 35 feet of permanent vegetation is established and maintained between the field and surface water.
  - Area can be grazed or cropped under a specific management plan, and permanent vegetation must be maintained at all times. (Permanent vegetative buffers 50' or greater in width may qualify to generate nutrient reduction credits.)
- 20 % Reduction Option
  - A reduction of 20% in the farm's overall nutrient balance beyond baseline compliance.[108]

The reductions generated will held achieve goals listed in Pennsylvania's Tributary Strategy.[109] A trading cap also has been placed on NPS trades to ensure that the trading program is not trading away reductions to meet the Strategy.[110] The three trading ratios allowed include delivery, reserve, and edge of segment.[111] The guidelines also include requirements for quantification and application of credits,[112] applying for approval for credit generation, monitoring and evaluation,[113] documenting credits and trades,[114] use of credits in NPDES

[108] Pennsylvania Department of Environmental Protection, *Appendix A: Nutrient Trading Criteria Specific for the Chesapeake Bay Watershed, 4, available at* http://www.dep.state.pa.us/river/Nutrient%20Trading%20Documents/Additions%2012-29-2006/Final%20APPENDIX%20A%20_12-28_.pdf.

[109] Personal communication with Ann Smith, Pennsylvania Department of Environmental Protection (Jul. 23, 2007).

[110] *Id*. at 3.

[111] *Delivery Ratio* compensates for a nutrient or sediment's travel in water and will be applied to point and non-point sources. The ratio varies depending on the distance of the source from the mainstem of the Chesapeake Bay. Generally, the greater the distance the pollutant has to travel, the greater the pollutant loss will be. This ratio works to equalize a trade between a source in the headwaters and one near the mainstem. Delivery ratios will be based on information from applicable and accepted data sources, such as the Chesapeake Bay Watershed Model. *Reserve Ratio* is applied to implement policy-driven decisions to require part of the credits generated be reserved to cover for failed credit generating activities. This ratio adds another layer of security to the credits. The reserve ratio will be ten percent and will apply to all credits. This percentage applied may change over the life of the trading program. *EOS Ratio* is a factor that is unique to each watershed model segment that has been determined by the Chesapeake Bay Watershed Model in order to estimate the EOS [Edge of Segment] load for individual non-point sources within a watershed segment. This ratio can also be referred to as "EOS Factor".

[112] *Id*. at 6.

[113] *Id*. at 7.

[114] *Id*. at 8.

permits,[115] use of credits in the Sewage Facilities (Act 537) Planning Program,[116] and public participation. [117]

Monitoring and Verification
The PA DEP "will conduct verification of baseline, threshold and reduction activities/technologies. Sampling and other monitoring will be conducted where/when appropriate."[118] NPDES permittees must ensure credits are approved by the PA DEP and for enforcing terms of credit purchase agreements. If NPS credit generators or third parties do not meet terms of credit agreements then the PA DEP will take action. Furthermore, all credit calculations must be approved by the PA DEP before they may be purchased or sold, and trades must be registered before they can be used to meet permit requirements or regulatory requirements.[119]

Summary
1. Point sources and NPS must meet eligibility criteria to be able to participate (buy or sell credits) in the trading program. (Note: A point source may purchase credits from whoever has certified credits. The PA DEP does not require them to purchase from one source before looking to other avenues).
    a. Point sources must meet either technology based or water quality based effluent limitations in NPDES permits (which ever is more stringent). Trading cannot be used to meet technology based limits.
    b. NPS must meet different regulatory requirements based on type of NPS (agriculture versus urban stormwater systems).
2. Point sources must reduce below either technology based or water quality based effluent limitations to be able to generate credits. Trading cannot be used to meet technology based limits.
3. Nonpoint sources must reduce discharge below regulatory requirements to be able to generate credits.
4. Proposals for generation of credits must be submitted to the PA DEP.
5. PA DEP must approve proposal and calculation of credits.
6. Trade must be initiated and registered with the PA DEP.

Point of Contact
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Kenneth Muir, Pennsylvania Department of Environmental Protection – Bureau of Water Quality Protection (good contact for imformation relating to the trading program and storm sewer systems)
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[115] *Id*. at 9.
[116] *Id*. at 9.
[117] *Id*. at 9.
[118] *Id*. at 11.
[119] *Id*. at 7-8.

DELAWARE

Water Pollution Control Regulations

When determining TMDL allocations, the Delaware Department of Natural Resources and Environmental Control's (DNREC)'s Water Pollution Control regulations state that the Department may consider alternative allocation schemes such as trading agreements between point sources and point sources and point sources and non-point sources. Those wishing to participate in this trading scheme must submit a petition and supporting documentation to the Secretary of the Department.[120] The Water Pollution Control regulations also state that Pollution Control Strategies may include pollution trading as a strategy to meet nutrient reductions.[121] For example, the DNREC Inland Bay Pollution Control Strategy includes a provision to allow nutrient trading for point sources to meet Total Maximum Daily Loads (TMDL). The DNREC must approve all trades on a case-by-case basis. Three regulatory requirements include:

1. Trades must occur within the same watershed (Indian River, Indian River Bay, Rehoboth Bay, or Little Assawoman Bay) as the point source discharge is located.
2. Trades must involve a trading ratio of at least 2:1 between nonpoint sources and point sources.
3. The nutrient load reduction involved in the trade must constitute reductions that occur beyond the baseline or the point or nonpoint source nutrient reductions required under the TMDL and this Pollution Control Strategy.

Point of Contact

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(302) 739-9949

NEW YORK

The New York has no water quality trading law, regulation, or policy. New York's Department of Environment Conservation (NY DEC) will consider potential nutrient trading opportunities on

[120] Regulations Governing the Control of Water Pollution § 8.03(c). Petitions must include: "(1) The identities of the point source(s) and, if applicable, nonpoint source(s) proposing to cooperate in the alternative allocation scheme; (2) The reach of interest over which the alternative allocation scheme is proposed; (3) The pollutant(s) or pollutant parameter(s) for which the alternative allocation scheme is sought; (4) The point(s) of discharge from the sources identified in Section 8.03.b.1. to the reach of interest; (5) A complete description of the alternative allocation scheme between the sources identified in Section 8.03.b.1., including an accounting of current and proposed pollutant loading from all cooperating sources; (6) An assessment of potential water quality impacts and benefits associated with the alternative allocation scheme described in Section 8.03.b.5., including a comparison of projected water quality conditions to applicable water quality standards; (7) A description of the discharge monitoring and reporting, or other mechanism proposed to assess the success of the alternative allocation scheme; (8) A description of the agreement that will be used between the cooperating point source(s) and, if applicable, nonpoint source(s) in implementing the proposed alternative allocation scheme. The description should include a discussion of the financial and institutional measures that the cooperating entities propose; and (9) A description of corrective actions that will be taken by the cooperating point source(s) and, if applicable, nonpoint source(s) in the event that the alternative allocation scheme fails to achieve the intended water quality objectives for the reach of interest."

[121] Regulations Governing the Control of Water Pollution §2.101.

a case by case basis during the development of individual watershed plans, water quality-based effluent limits and total maximum daily loads.[122]

In addition, New York's Chesapeake Bay Tributary Strategy states that the NY DEC will consider nutrient trading as one way to meet the Strategy's nutrient limits for significant wastewater treatment plants.[123] The Strategy also notes the importance of conducting a mass balance for a farm's nutrient levels to reduce source loads. This mass balance will also be useful if nutrient trading is initiated.[124]

New York City passed its Watershed Rules and Regulations (WR&R) for the Protection from Contamination, Degradation and Pollution of the New York City Water Supply and Its Sources in 1997. These rules and regulations set restrictions on construction for new or expansion of existing WWTP in phosphorus restricted areas. As a part of this regulation, the City established the Phosphorus Offset Pilot Programs.[125] However, this Program does not apply to any part of the Bay watershed; thus, it is included here only as an example of a trading program in New York.

Point of Contact
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WASHINGTON, DC

Water Pollution Control Act
The District of Columbia's Water Pollution Control Act[126] requires that when the Mayor issue permits for point sources of pollution, he/ she must include conditions under which the pollutant may be discharged and in what amount and location. He also must include monitoring requirements. The permitted discharge must meet to the stricter of the following: (1) meeting or attaining water quality standards or (2) removing pollutants with control technology.[127] The Mayor also has the authority to regulate nonpoint source pollution for real estate construction and development.[128] The Mayor also must develop a water quality management plan under which all permitted activities must comply.[129]

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[122] Personal communication with Peter Freehafer, New York Department of Environmental Conservation (Jul. 3, 2007).
[123] New York Department of Environmental Conservation, *New York State Tributary Strategy for Chesapeake Bay Restoration (2006),* 56*, available at* http://www.dec.ny.gov/docs/cbaystratdraft.pdf.
[124] New York Department of Environmental Conservation, *New York State Tributary Strategy for Chesapeake Bay Restoration (2006),* 28*, available at* http://www.dec.ny.gov/docs/cbaystratdraft.pdf.
[125] Hanna L. Breetz, Karen Fisher-Vanden, Laura Garzon, Hannah Jacobs, Kailin Kroetz, Rebecca Terry, *Water Quality Trading and Offset Initiatives in the U.S.: A Comprehensive Survey (Aug. 5, 2004), available at* http://www.dartmouth.edu/~kfv/waterqualitytradingdatabase.pdf.
[126] D.C. CODE ANN. § 8-103.1 et seq.
[127] D.C. CODE ANN. § 8-103.06(b).
[128] D.C. CODE ANN. § 8-103.06(c).
[129] D.C. CODE ANN. § 8-103.11(a)

Nutrient trading as a concept is supported by the District Department of the Environment (DDOE); however, the District only has one sewage treatment plant (Blue Plains) and no agricultural NPS, both of which often are primary players in trading programs.[130]

Point of Contact

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[130] Personal communication with Hamid Karimi, District Department of the Environment (Jul. 20, 2007).

SUMMARY TABLE OF NUTRIENT/ WATER QUALITY TRADING[131]

NOTE: Overall regulatory drivers for each state include the Clean Water Act (NPDES permits) and Total Maximum Daily Loads. The 2000 Chesapeake Bay Agreement and Tributary Strategies also can be considered drivers for nutrient trading programs.

VIRGINIA			
Chesapeake Bay Nutrient Trading Program	**Regulatory Drivers**	Chesapeake Bay Watershed Nutrient Credit Exchange Program	VA. CODE ANN. §§ 62.1-44.19:12 to 62.1-44.19
		Chesapeake Bay Watershed Nutrient Credit Exchange Program Regulations	9 VA. ADMIN. CODE § 25-820-70 et seq.
		Municipal separate storm sewer systems regulations	4 VA ADMIN. CODE § 50-60-380 et seq.
	Transaction Requirements (Baseline and thresholds)	***Point Source****: Significant dischargers*: Existing facilities that discharge 100,000 gallons or more from a WWTP or equivalent load into tidal waters or existing facilities that discharge 500,000 gallons or more or equivalent load into non-tidal waters may participate in trading if they have registered for the Virginia Department of Environmental Quality's (VA DEQ) general VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay. These covered facilities (125) must meet effluent limitations or cap loads that are based on waste load allocations (derived from tributary strategy and water quality management planning regulation) as well as specific conditions and monitoring requirements. Permits establish the effluent limitations and the conditions for exchanging credits. Significant dischargers may also meet effluent standards through treatment technology improvements or payment into the state Water Quality Improvement Fund (WQIF). They may not purchase offsets from the non-point source discharger reductions.[132] *Non-significant dischargers*: New or expanding facilities that discharge 40,000 gallons or more per day from a WWTP or equivalent load directly into tidal or non-tidal waters also must register for the VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges	

[131] Most information in this document is taken directly from the *Water Quality Trading Programs Comparative Chart for Development of Program in the WV Potomac Drainage* (*Working Draft)*, unless otherwise footnoted. This spreadsheet is not available online, but is referenced at http://wvwri.nrcce.wvu.edu/programs/pwqb/index.cfm#documents. It is on file with author.

[132] U.S. Environmental Protection Agency, *Water Quality Trading Toolkit for Permit Writers (Aug. 2007), available at* http://www.epa.gov/owow/watershed/trading/WQTToolkit.html.

	and Nutrient Trading in the Chesapeake Bay to participate in trading. Effluent limits and conditions for trading are contained in these general permits. Expanding facilities must have no-net increase based on current discharge allowances. Expanding non-significant dischargers also may avoid buying credits based on not having net increase but cannot generate credits.[133] New dischargers must offset their entire load. Both new and expanding non-significant dischargers may purchase nutrient reductions from NPS that reduce nutrients levels through the use of best management practices as offsets. Facilities that install nutrient removal equipment must meet annual concentration technology-based limit in their individual permit, but this is not a prerequisite to trading.[134] ***Nonpoint source:*** Farmers must implement suite of tributary strategy practices and can trade credits derived only from practices above and beyond these practices. Credits cannot be derived from state or federally funded practices. Practice is not eligible for credits if it contributes to phosphorus or nitrogen loadings even if there are reductions in the other practice (e.g., phosphorus credits for a practice that reduces phosphorus but increases nitrogen). Suite of Tributary Strategy practices may be implemented to generate nutrient reductions, including nutrient management plans, waste storage facilities for all permitted animal feed operations (AFOs) or concentrated animal feed operations (CAFOs), conservation tillage, 35 foot buffers; cover crop (row crop), or livestock exclusion (pasture).[135]
Credit allocation method, units of credits, etc.	***Credit allocation method:*** *Compliance credits:* Each January, all permitted facilities must submit an annual report to the VA DEQ on their delivered waste load allocations and credits that will be needed or available for sale. Based on this, the VA DEQ verifies and determines the amount of compliance credits available for sale and purchase, and WWTP may establish trading partners individually or through the Nutrient Trade Exchange Association (the ExChange). All transactions must be complete by April (these are after-the-fact credits). [136]

[133] *Id.*
[134] *Id*
[135] West Virginia Water Research Institute, *Water Quality Trading Programs Comparative Chart for Development of Program in the WV Potomac Drainage (Working Draft),* [on file with author].
[136] U.S. Environmental Protection Agency, *supra* note 2; West Virginia Water Research Institute, *supra* note 5.

Offsets: New or expanding facilities that decide to offset their load must determine the offsets they will need for a following year by the July prior to that year. Liability is only an issue for offsets (compliance credits exchanged represent after-the-fact reductions). Offset trade between point sources represents transfer of part of load limit; seller is responsible for future compliance with reduced load limit. Non-point offsets are the responsibility of the purchaser. If non-point offset cannot be verified, permittee may attempt to comply with load limit by purchasing compliance credits at end of calendar year; otherwise, DEQ will undertake enforcement action.[137] (Note: VA DEQ is working on guidance for the trading program.)[138]

Unit of credit: Delivered pounds/ year

Credit duration: 1 year/ renewable for life of BMP

Price mechanism: Compliance credits may be traded between point sources at the end of each calendar year (price set by market). Proposed discharges by new and expanding point sources must be offset by purchases from point or non-point sources (price set by market). VA DEQ's price of "compliance credit" would be a last resort and would be equal to cost of tech control (only used for credits already available through WQIF). VA DEQ price of "offset" as last resort would be equal to greater of cost of tech control by point sources or two times cost of technology control by NPS in tributary basin of concern.

Payment to the WQIF for compliance credits is $11.06 for each pound of nitrogen and $5.04 for each pound of phosphorus.[139]

Credit Reserve: The WQIF is a revolving fund where VA DEQ purchases credits and WWTPs who are unable to find credits elsewhere may purchase credits from the fund, the price is set as described above.

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[137] West Virginia Water Research Institute, *supra* note 5.
[138] Personal communication with Kyle Winter, Virginia Department of Environmental Quality (Jul. 20, 2007).
[139] U.S. Environmental Protection Agency, *supra* note 2.
[140] *Id.*

		Credit Ratio: Credits are used in the following ratios: 1:1 for point source Load Reduction, 2:1 NPS Load Reduction (two pounds of reduction for every proposed pound of discharge). Note: Point source Load Reduction ratio is adjusted by Delivery Ratio (ratio accounts for discharge location and nutrient attenuation as calculated using the Chesapeake Bay Watershed Model, resulting in potential credit ratios that are greater than 1:1) and Edge of Segment Ratio ([140] ***Other:*** Credits can not be generated through state or federal cost-share programs. Credits are certified and registered by the VA DEQ.
	Characterization of buyers and sellers	***Buyers:*** NPDES Permittees (significant dischargers, and non-significant dischargers over 40,000mgd), drinking water suppliers (very limited- only in specific circumstances where they discharge phosphorus as a by product of purifying water) ***Sellers:*** NPS dischargers (agriculture and developed land projects – such as brownfield restoration). Potential for municipal storm water system owners in the future. ***Bankers/ aggregators:*** Nutrient Credit Exchange Association (association of regulated point-sources); Individual NPS brokers/aggregators, Water Quality Improvement Fund (VA DEQ aggregator of NPS credits)
	Geographic extent	Credit or offset exchanges must occur within the defined tributary watershed and cannot adversely affect local water quality conditions. NPS cannot sell load reductions generated with federal or state dollars. NPS reductions can only be purchased for offsets if no point source reductions are available within the watershed. James, Shenandoah-Potomac, Rappahannock, York, and Eastern Shore Watersheds
	Flow of capital	Regulated entity to regulated entity, regulated entity to aggregator/ Nutrient Credit Exchange Association to buyer, NPS to NPS brokers/ aggregators to buyer, NPS to Water Quality Improvement Fund (VA DEQ aggregator of NPS credits) to buyer (NOTE: Buyers are regulated entities)
	Transactions	None have taken place so far. Trading should begin in 2008. [141]
Other Trading Programs/	**Summary**	Blue Plains Sewage Treatment Plant had a proposed program in place to trade credits based on its reduced flows from installing biological nutrient reduction retrofits. However, the program was

[141] Winter, *supra* note 8.

Projects	not implemented because the 2000 Chesapeake Bay Agreement set more stringent reduction targets, providing other plants with more of an incentive to upgrade technology.[142]

[142] Hanna L. Breetz, Karen Fisher-Vanden, Laura Garzon, Hannah Jacobs, Kailin Kroetz, Rebecca Terry, *Water Quality Trading and Offset Initiatives in the U.S.: A Comprehensive Survey (Aug. 5, 2004), available at* http://www.dartmouth.edu/~kfv/waterqualitytradingdatabase.pdf.

PENNSYLVANIA

Nutrient Trading Program	**Regulatory/ Policy Drivers**	Pennsylvania Clean Streams Law	35 P.S. §§ 691.1 to 691.1001
		Final Trading of Nutrient and Sediment Reduction Credits Policy and Guidelines	Pennsylvania Department of Environmental Protection, *Final Trading of Nutrient and Sediment Reduction Credits- Policy and Guidelines, Document # 392-0900-001(Dec. 2006), available at* http://www.depweb.state.pa.us/chesapeake/lib/chesapeake/dec29_2006/finalpolicy_12-28.pdf
		Safe Drinking Water regulations	25 PA. CODE §§ 109.1 to 109.1101
	Transaction Requirements (Baseline and thresholds)	***Point Source:*** Point sources must meet legal technology or water quality-based effluent limits (stricter of the two). New point sources must offset 100 percent of their discharges (net zero increases). *Significant dischargers*: Cap load based on 6 mg/l TN and 0.8 mg/l TP at design flow. (A few point sources previously agreed to a cap at 8mg/l TN and 1mg/l TP at projected 2010 flows and are allowed to keep this cap.). *Non-significant dischargers*: No-net increase based on current discharge. They must meet Waste Load Allocation (WLA) and technology-based limits (same as baseline). ***Non point Source:*** *Agriculture:* To participate in trading agriculture operations must be in compliance with Act 38 Nutrient Management Regulations, Chapter 102 Erosion and Sedimentation Regulations, Chapter 91.36 (Ag operations), and Chapter 92 (CAFOs only), as applicable. In addition one of the following three requirements must be met: (1) a 1 to 100 foot mechanical setback or equivalent is required (this is achieved when ***one*** of the following is met: manure is not mechanically applied within 100 feet of surface water; there are no surface waters on or within 100 feet of the farm; and farm uses no manure application and applies commercial fertilizer at or below the Penn State recommended agronomic rates); (2) a 2 to 35 foot buffer or equivalent (this is achieved when all of the following are met: a minimum of 35 feet of permanent vegetation is established and maintained between the field and surface water; area can be grazed or cropped under a specific management plan; and permanent vegetation must be maintained at all times (permanent vegetative buffers 50 feet or greater in width may qualify to generate nutrient reduction credits)); or	

	(3) a 3 to 20 percent reduction option (i.e., a reduction of 20 percent in the farm's overall nutrient balance beyond baseline compliance). Note: Credits will not be generated from the purchase and idling of whole or substantial portions of farms to provide nutrient credits for use offsite. Individuals are eligible for nutrient credit generation when converting one land use to another, where the post-construction reduced nutrient loading can be established.
Credit allocation method, units of credits, etc.	*Urban Stormwater Runoff:* Must be in compliance with 25 Pa. Code §§ 92.2(b) and 92.21a(g). ***Credit Allocation Method:*** Point source credits will be based on how much a facility reduces its discharge below its cap load. NPS credit generation will be based on PA DEP-approved proposals by NPS dischargers. In addition, the World Resource Institute's (WRI) Nutrient Net will serve as an online marketplace. ***Credit calculation:*** WRI, Pennsylvania Environmental Council (PEC), PA DEP, and the Agricultural Workgroup developed a nitrogen calculation spreadsheet to use to calculate credits generated via BMPs. ***Unit of Credits:*** Delivered pounds/ year ***Credit Duration:*** 1 year/renewable annually for life of BMP generated October 1st –September 30th. ***Price mechanism:*** Market supply and demand ***Credit Reserve:*** Yes (10 percent of credits generated are diverted to this fund. Credit price is set by the market). ***Credit Ratio:*** 1.1:1 Point source Load Reduction (adjusted by: Delivery Ratio and 10 percent Credit Reserve Ratio-applied to credits generated) 1.6:1 NPS Load Reduction (adjusted by: Delivery Ratio, Edge of Segment Ratio, and 10 percent Credit Reserve Ratio- applied to credits generated) ***Other:*** Credits may be generated by state or federal cost-share programs.
Characterization of buyers and	***Buyers:*** NPDES Permittees (significant and non-significant dischargers)

	sellers	***Sellers:*** NPS dischargers (agriculture, urban storm water), landowners implementing forest practices or other land management practices that result in reduction ***Aggregators:*** Brokers/aggregators in a credit exchange market, WRI
	Geographic extent	All sales must be within same watershed and for certified credits or within a TMDL watershed.
	Flow of capital	Trades may take place between any combinations of eligible point sources, non-point sources, and third parties
	Transactions	Three contracts/ trades have taken place and all relate to improving agricultural processes (e.g., manure and till practices).[143] Twenty-four proposals for trades have been submitted to the PA DEP.[144]
Other Trading Programs/ Projects	**Summary**	Conestoga Nutrient Trading Pilot was developed prior to trading guidelines. Enterprising Environmental Solutions worked with the Pennsylvania Environmental Council (PEC) to implement a natural stream restoration project in New Street Park and a nutrient trade in Lititz, Pennsylvania. Pfizer, Inc. provided funding for the restoration project in the park, which is owned by the Borough of Lititz. An analysis was conducted to determine the estimated annual nitrogen, phosphorus, and sediment load reductions that would result from the restoration. In December 2004, Lititz and Pfizer, Inc. signed a contact to transfer the pollutant reduction credits from the Borough to Pfizer, Inc.[145]

[143] Personal communication with Ann Smith, Pennsylvania Department of Environmental Quality (Jul. 23, 2007).
[144] *See* Pennsylvania Department of Environmental Quality, *Nutrient Trading*, *at* http://www.dep.state.pa.us/river/Nutrient%20Trading.htm [last accessed Jul. 31, 2007].
[145] Enterprising Environmental Solutions, *Market-based Environmental Quality Enhancement,* http://www.eesi21.org/market.htm [last accessed Jul. 25, 200].

MARYLAND

Proposed Trading Program	**Regulatory Drivers**	Water Pollution Act	MD. CODE ANN., ENVIR. §§ 9-301 et seq.
		Chesapeake and Coastal Bays Critical Area Act	MD. CODE ANN., NAT. RES. § 8-101 et seq.
		Water Quality Improvement Act of 1999	MD CODE ANN. AGRIC. § 8-801 to -807
	Transaction Requirements (Baseline and thresholds)	***Point Sources*:** Point sources must meet a cap load based on 4mg/l N and .03mg/l P and design capacity for significant sources. *Non-significant sources*: The threshold for non-significant sources is 2020 projected design or flow, whichever is less. All new or expanding sources must offset 100 percent of their discharge. *Significant dischargers:* Significant dischargers are only eligible to generate credits for trading when the enhanced nutrient removal (ENR) treatment system is in operation and permit limits are in effect. WLA is Tributary Strategies, caps, and performance requirements serve as a baseline for point sources. *Minor Dischargers:* May generate credits when the baseline loads of 6,100 lbs/yr of nitrogen and 457 lbs/yr of phosphorus or less are assigned as a permit limit and the floating caps are below the baseline. A facility trading away credits based on a determination that it has excess capacity must demonstrate that the trade is consistent with the Water and Sewer Plan, and a current wastewater capacity management plan – these documents will be pre-requisites for trading. Credits and offsets shall be in place prior to trade. ***Non-point Source:*** To be determined when NPS trading is developed. *Stormwater:* To be determined
	Credit allocation method, units of credits, etc.	***Credit Allocation Method:*** MDE will determine credit distribution of the WLA for the above aforementioned caps. The baseline cap allocations do not become eligible for trading by a permittee until they are adopted in permits through the public process. ***Credit calculation:*** Nutrient Net has been discussed as an option (Dartmouth database) ***Unit of Credits:*** Delivered pounds/ year

		Credit Duration: Credits/offsets shall be available for a minimum of 30 years. A new or expanding sewage treatment plant requiring additional allocation must obtain enough offsets to provide for at least 30 years of operation of the facility. Industrial facilities must obtain offsets for a period of at least 10 years (2 permit cycles). Credits may be traded retroactively to address short-term permit compliance issues (subject to certain restrictions). ***Price mechanism:*** Market ***Credit Reserve:*** To be determined. ***Credit Ratio:*** To be determined, when NPS trading is developed ***Other:*** Whether credits can be generated by state or federal cost-share programs will be decided when the NPS trading policy is developed.
	Characterization of buyers and sellers	***Buyers:*** NPDES Permittees and Septics ***Sellers:*** To be determined ***Aggregators:*** To be determined when NPS trading policy is determined
	Geographic extent	Point Source credit exchanges must take place within state-established trading regions, i.e., Potomac, Patuxent, Eastern and Western Shore, including the Maryland portion of the Susquehanna watershed.
	Flow of capital	Point source to point source. Others to be determined once the NPS policy has been developed.
	Transactions	None.
Other Trading Programs/ Projects		Maryland Department of Agriculture received a Conservation Innovations Grant from the USDA, part of which will go towards developing and implementing a pilot nutrient trading program between NPS and PS in the upper Chesapeake Bay. MDE also will take participate in the project. The program will allow for intra and interstate trades. Throughout the project, the MDA and MDE will evaluate various complicated issues associated with nutrient trading, such as how to quantify credits associated with implementing BMPs on agricultural lands. The pilot is meant to show that nutrient trading can be successful at reducing nutrient runoff into the Bay.[146]

[146] Southern Maryland Online, *Md. Receives $854,000 in Grants for Agricultural Conservation* (*Jul.15, 2007)*, *at* http://somd.com/news/headlines/2007/6132.shtml.

WEST VIRGINIA

Proposed Trading Program	**Summary**	Currently, no trading program is in place; however, the West Virginia Water Research Institute (WVWRI), WRI, and the Natural Resources Conservation Service are working together to develop and implement the West Virginia Potomac Water Quality Bank and Trade Program. The WVWRI received a three year grant from the NRCS to carry out this project, and they are in the sixth month of the three year project. Currently, working groups have been established to consider various aspects of the proposed market – urban, agriculture, and point sources of pollution – and the programs in Pennsylvania, Virginia, and Maryland. These working groups will report back to the steering committee on their recommendations so that a framework can be designed and implemented.[147]
	Regulatory Drivers	Water Pollution Control Act W.VA CODE § 11-1 et. seq.
Other Trading Programs/ Projects	**Summary**	Rockymarsh Run Watershed Network (part of the Conservation Fund's Freshwater Institute) has received a grant from the National Fish and Wildlife Foundation to implement a nutrient trading pilot project within the basin.[148] Through this project, the Conservation Fund will work with private landowners to restore and protect riparian buffers, apply Low Impact Development practices on recently developed lands, and pump and repair septic systems. These efforts will reduce nitrogen, phosphorus, and sediment that enter into Rockymarsh Run. Reductions will be quantified and sold as offsets to wastewater treatment plants. This pilot project will demonstrate how water quality trading can work for watershed in West Virginia.[149]

[147] Personal communication with Richard Herd, West Virginia Water Research Institute (Aug. 8, 2007).
[148] Personal communication with Alana Hickman, West Virginia Department of Environmental Protection (Jul. 20, 2007).
[149] Chesapeake Bay Program, *Chesapeake Bay Targeted Watersheds Grant Program (2007), available at* http://www.chesapeakebay.net/info/pressreleases/targeted2007/2007_Project_Narratives.pdf.

Species/ Habitat Mitigation Banking Regulatory Baseline

Federal Regulatory Baseline

FEDERAL HABITAT BANKING POLICY

"In 2003, the [U. S. Fish and Wildlife] Service published national level guidance for the establishment, use, and operation of conservation banks to satisfy mitigation requirements under the Endangered Species Act. The Service's guidance seeks to promote conservation banking by providing consistency in the establishment and use of banks, as well as transparency to landowners and developers regarding the rules of the banking process. It applies to banks established on private, tribal, state, or local lands, and neither covers nor precludes conservation banks on Federal lands. The full details of the guidance can be found on the web at http://endangered.fws.gov/policies/conservation-banking.pdf."[150]

Covered Species, Service Area, and Credits
Banks may be established in a variety of ways, including "(1) acquisition of existing habitat; (2) protection of existing habitat through conservation easements; (3) restoration or enhancements of disturbed habitat; (4) creation of new habitat in some situations; and (5) prescriptive management of habitats for specified biological characteristics."[151]

"Under the guidance, the goal of conserving listed species sets the standard against which the Service decides whether to approve conservation banks. Approval of a bank amounts to a judgment that the bank's contribution to the conservation of the covered species will be sufficient to offset authorized adverse impacts to that species in the bank's service area. The Service is to evaluate proposed banks in relation to a scientifically sound conservation strategy (such as a recovery plan, when available) for the species covered by the bank, and assess whether the bank furthers that strategy." [The] "guidance recommends siting banks in large, unfragmented regions of habitat adjacent to areas already managed to benefit the covered species, or in areas that serve as corridors. Non-restorable areas should be excluded from bank boundaries. All banks also must implement active management programs." [152]

"The goal of species conservation provides the basis for designating the service areas of banks. The guidance advises that banks be located within areas designated by recovery plans as 'recovery units' or other recovery focal areas. A bank's service area [must] correspond to the recovery area in which the bank is located. If there is no recovery plan

[150] This text is from a draft version of Bean, Michael and Jessica Wilkinson. In press. "Design of U.S. Habitat Banking Systems." Environmental Law Institute.
[151] From Matt Hogan, Director of U.S. Fish and Wildlife Service to Regional Directors, Regions 1-7 Manager, California Nevada Operations, Guidance for the Establishment, Use, and Operation of Conservation Banks (May 2, 2003), available at http://www.fws.gov/endangered/policies/conservation-banking.pdf.
[152] This text is from a draft version of Bean, Michael and Jessica Wilkinson.In press. "Design of U.S. Habitat Banking Systems." Environmental Law Institute.

for the species, the bank location and service area should be based on similar considerations."[153]

According to the "guidance, 'species or habitat conservation value *outcomes* (e.g., numbers of nesting pairs and family groups, or enhanced or created habitat), not the implementation of actions that are causal to those outcomes and values, are the standards by which the Service will evaluate banks and authorize issuance and sale of mitigation credits.' In other words, issuance of credits is conditional upon the success of the bank's management program in meeting the conservation needs of the covered species rather than the banker's implementation of that program." [154]

Conservation Commitment and Banking Agreements
"Conservation banks may employ a variety of conservation strategies, including 'preservation, management, and restoration of degraded habitat, connecting of separated habitats, buffering of already protected areas, creation of habitat, and other appropriate actions.' Regardless of the strategy, bank owners must commit to manage the natural resource values of their banks *in perpetuity*. To effect such a commitment, an owner must convey a permanent conservation easement over the bank property and provide adequate funding for the perpetual operation of the bank. The guidance recommends that bank owners establish a non-wasting endowment fund by depositing a fixed amount for every credit sold." [155]

"A written banking agreement between the conservation bank owner and the Service [must] be prepared for every bank. The guidance lists the required content for conservation banking agreements, providing a national standard for documenting the establishment and operation of conservation banks. Among the requirements is a management plan. The management plan is to identify the management actions necessary to achieve the conservation goals of the bank, and provide assurance of long-term funding to manage the bank in perpetuity via an endowment fund. A designated bank manager is responsible for implementing the management plan. Conservation banking agreements must include provisions for remedial action in the event that the bank owner or manager fails to meet obligations specified in the banking agreement… The guidance does not require that a management plan be approved by the Service before credits become available for sale." [156]

HABITAT CREDIT TRADING AGREEMENT

In April 2007, directors of the U.S. Department of Agriculture, Natural Resources Conservation Service, the U.S. Department of Interior, Fish and Wildlife Service, and the Association of Fish and Wildlife Agencies signed a partnership agreement to evaluate

[153] *Id.*
[154] *Id.*
[155] *Id.*
[156] *Id.*

habitat trading markets as a way to protect endangered species and to research how to coordinate efforts and programs to promote habitat banking.[157]

State Regulatory Baseline

No Chesapeake Bay states have habitat conservation banking-related laws, regulations, or policies.

VIRGINIA

Virginia's fish and game laws and regulations do not include provisions relating to mitigation of impacts to endangered species or habitat conservation banking. They also do not outline any requirements relating to recovery plans or critical habitat designations.[158]

MARYLAND

Pursuant to Maryland's threatened and endangered species regulations, when issuing a permit to take an endangered species, the MDNR must consider "[w]hat protection there is for the species' continued existence."[159] However, the regulations do not identify what protections are allowed.

PENNSYLVANIA

Pennsylvania's endangered and threatened species regulations say nothing in regards to preventing or mitigating impacts to species and their critical habitat. They also make no mention of recovery plan requirements or establishment of critical habitat.[160] However, Pennsylvania's regulations relating to water quality permits require that anyone applying for a NPDES permit or Erosion and Sediment Control Permit consult the Pennsylvania Natural Diversity Inventory (PNDI) to identify species on their lands. If activities will impact endangered species or their critical habitat, the person proposing the activity must work to prevent and avoid the impacts, or if they cannot be avoided, identify how the impacts will be minimized.[161]

DELAWARE

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[157] Natural Resources Conservation Service, *USDA, DOI, AND AFWA Sign a Habitat Credit Trading Agreement (Apr. 13, 2007), at* http://www.nrcs.usda.gov/NEWS/releases/2007/habitatcredittradingagreement.html.
[158] VA. CODE ANN. § 29.1-564; 4 VA. ADMIN. CODE §15-20-130
[159] MD. CODE REGS. § 08.03.08.03(E)(2)(c).
[160] 34 PA. CODE §§ 2167; 2924.
[161] 25 PA. CODE § 102.6(a).

Delaware's endangered species laws and regulations do not include provisions relating to prevention, avoidance, or mitigation of impacts to endangered species. They also contain no requirements relating to recovery plans or critical habitat designations.[162]

[162] 7 DEL. CODE ANN. §§ 601 to 605; DEL. ADMIN. CODE § 3900-16 et seq.

NEW YORK

New York endangered species laws and regulations do not include any provisions relating to mitigating impacts to endangered species. They also do not mention a requirement to develop a recovery plan or designate critical habitat. The New York Department of Environmental Conservation's (NY DEC) regulations do note that when the Department issues a permit for an allowed take of a species, it may include any conditions it deems appropriate.[163] However, the types of conditions that may be incorporated into the permit are not described.

WEST VIRGINIA

West Virginia has no laws or regulations governing the take, possession, transport, etc. of endangered or threatened species within the State.

WASHINGTON, D.C.

Washington, D.C. has no laws pertaining to endangered or threatened species within the District.

[163] N.Y. ENVTL. CONSERV. LAW § 11-0535; N.Y. COMP. CODES R. & REGS tit. 6 § 182.

SUMMARY TABLE OF HABITAT/ SPECIES BANKING

VIRGINIA		
Summary	There are no laws, regulations, guidance, or standards for species/ habitat banks in Virginia.	
Potential Drivers	Laws and regulations relating to taking of endangered species	VA. CODE ANN. § 29.1-564; 4 VA. ADMIN. CODE §15-20-130
Banks	None	
MARYLAND		
Summary	There are no laws, regulations, guidance, or standards for species/ habitat banks in Maryland.	
Potential Drivers	Endangered species regulations	MD. CODE REGS. § 08.03.08.03(E)(2)(c)
Banks	None	
PENNSYLVANIA		
Summary	There are no laws, regulations, guidance, or standards for species/ habitat banks in Pennsylvania.	
Potential Drivers	Regulations relating to endangered species	34 PA. CODE §§ 2167; 2924
	Erosion and Sediment Control regulations	25 PA. CODE § 102.6(a)
Species Banks	Pennsylvania State University (PSU) has a habitat banking project for bog turtles. Mitigation sites will generate credits that developers will be able to purchase. "Funds in the bank will be used for additional conservation." This banking project aims to decrease pressure from poaching and development on bog turtles.[164]	
DELAWARE		
Summary	There are no laws, regulations, guidance, or standards for species/ habitat banks in Delaware.	
Potential Drivers	Laws and regulations relating to taking of endangered species	DEL. CODE ANN. tit. 7 §§ 601 to 605; DEL. ADMIN. CODE § 3900-16 et seq.
Banks	None	
NEW YORK		
Summary	There are no laws, regulations, guidance, or standards for species/ habitat banks in New York.	
Potential Drivers	Laws and regulations relating to endangered species	N.Y. ENVTL. CONSERV. LAW §§ 11-0535; N.Y. COMP. CODES R.

[164] U.S. Fish and Wildlife Service, *Minutes: Forestry Workgroup Meeting (Nov. 28, 2006), available at* http://www.chesapeakebay.net/pubs/calendar/FWG_11-28-06_Minutes_1_7160.pdf

& REGS tit. 6 § 182

Banks		None

WASHINGTON, D.C.

Summary		There are no laws, regulations, guidance, or standards for species/ habitat banks in Washington, D.C.
Potential Drivers		No endangered species laws or regulations.
Banks		None

WEST VIRGINIA

Summary		There are no laws, regulations, guidance, or standards for species/ habitat banks in West Virginia.
Thunderstruck Conservation Bank[165] (Private)	**Transaction requirements**	The Sustainable Land Fund will implement a land use plan "incorporating significant preservation of ecologically sensitive areas, restoration of endangered species habitat, sustainable timber practices, and limited development." This will generate credits available for various public and private entities.
	Credit allocation, unit of credits, etc.	***Unit of Credits:*** acres of habitat ***Credits in bank:*** 800 acres (adjacent to the Monongahela National Forest's proposed Roaring Plains Wilderness) ***Credit Type:*** 4 types available – High Elevation Red Spruce Habitat, Terrestrial Habitat (Lower elevation), White Monkshood (Aconitum reclinatum), Cave dwelling species[166] ***Price mechanism:*** Cost of credit is not known at this time. ***Other:*** Project will preserve another 1,000 acres for sustainable forestry. Another small portion of land may be reserved for limited residential development.
	Buyers and sellers	***Buyers:*** Public and private enterprises with projects that will impact high elevation species. ***Seller:*** Sustainable Land Use Fund (Environmental

[165] Sustainable Land Fund, *Thunderstruck Conservation*, *at* http://www.slfusa.com/bank.html [last accessed Jul. 26, 2007].
[166] Sustainable Land Fund, *Thunderstruck Conservation*, *at* http://www.slfusa.com/bank.html [last accessed Jul. 26, 2007].

	Banc and Exchange is working with the USFWS to establish and implement the bank)
Geographic extent	Randolph County: land adjacent to Monongahela National Forest
Flow of capital	Public or private enterprise that impacts upland habitat to Thunderstruck Conservation Bank

REGULATORY BASELINE FOR WETLANDS

Federal Regulatory Baseline *[The below is taken directly from a 2002 ELI report entitled "Banks and Fees: The Status of Off-Site Wetland Mitigation in the United States"]*

Overview[167]

"Land development activities may adversely impact wetlands that are protected under federal, state, and local regulatory programs. Wetlands receive legal protection because they are a significant ecological resource and because they provide a variety of functions that are of value to humans, including water purification, flood storage, sediment trapping, wildlife habitat and groundwater recharge.[168]

Most conversions of wetlands through development activities require a federal or state government permit. Permits authorizing impacts to wetlands reflect a public policy that attempts to balance wetland protection with alternative land uses. Under several regulatory programs, including §404 of the federal Clean Water Act (CWA),[169] a regulatory agency may impose conditions upon its approval for the activities that would destroy or impact a wetland.[170] The agency may require the permittee to replace the lost wetland and its functions by substituting replacement wetlands. This process is called compensatory mitigation. Compensatory mitigation may be accomplished through the

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[167] Note: In March 2006, the U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers ("Corps") issued a proposed rule on compensatory mitigation that sets out to establish "to an extent that is feasible and practical, equivalent standards for all forms of compensatory mitigation. Specifically the proposed rule *as written*:

- Establishes standards and criteria for all mitigation methods;
- Affirms mitigation sequencing (avoidance, minimization and compensatory mitigation); (3) Requires the watershed approach to compensatory mitigation;
- Prescribes standards for choosing appropriate mitigation, including site selection, "in-kind" replacement, replacement ratios, the use of banks, the use of preservation, and buffer mitigation;
- Sets administrative requirements and performance standards;
- Addresses mitigation banking establishment and credit withdrawal; and
- Eliminates in-lieu fee (ILF) mitigation as an option for providing compensatory mitigation.

Compensatory Mitigation for Losses of Aquatic Resources, 71 Fed. Reg. 15,520 (2006) (to be codified at 33 C.F.R. pt. 325 and 332, and 40 C.F.R. pt. 230) (proposed Mar. 28, 2006). p. 15,521.
It also will promote innovation and focus on results. "In order to ensure successful resource replacement projects, the proposed standards establish sound and enforceable administrative requirements for all types of compensation projects concerning: [r]al estate instruments that protect the site; [f]inancial assurances for near- and long-term site stewardship; [m]onitoring and contingency planning; and [i]dentification of parties responsible for project tasks. U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers, *Proposed Wetlands Conservation Rule, available at* http://www.epa.gov/owow/wetlands/pdf/CompMitRuleFactsheet.pdf [last accessed Aug. 7, 2007].

[168] For a thorough discussion of wetland functions and values, see Mitsch, William J. and James G. Gosselink. *Wetlands.* New York: Van Nostrand Reinhold, 1993. 507-540.

[169] 42 U.S.C. §1344.

[170] Compensatory mitigation is also required by the Corps under §10 of the Rivers and Harbors Act, which authorizes the Corps to regulate dredging and filling activities in navigable waters. (33 U.S.C. §§403, 407). For more information on the history of the Rivers and Harbors Act, see Strand, Margaret N. *Wetlands Deskbook, 2nd Edition*. Washington DC: Environmental Law Institute, 1997.

restoration, creation, enhancement, or preservation of wetlands.[171] Compensatory mitigation performed on or adjacent to the development site is referred to as on-site mitigation.

In the past 20 years, several alternatives to on-site mitigation have arisen, including wetland mitigation banking, in-lieu-fee mitigation, and project-specific offsite mitigation. These are often referred to as off-site mitigation programs.

Permittee-responsible mitigation remains the dominant form of compensatory mitigation. In these cases, the permittee compensates for its own impacts either on- or off-site in a manner approved by the regulatory agency on a case-by-case basis. In contrast, wetland mitigation banking is the practice of restoring, creating, enhancing, or preserving off-site wetland areas to provide compensatory mitigation for authorized impacts to wetlands.[172] In the past ten years, wetland mitigation banking has thrived as a compensatory mitigation technique to mitigate for wetland impacts in the United States.[173] With wetland mitigation banking, an agency or organization, often not the permittee, establishes larger off-site wetland areas that are used to mitigate for a number of smaller independently permitted wetland conversions. The permittees are released of their obligations to produce the compensatory wetland functions and instead can purchase them from the entity that, in most cases, has produced and "banked" them for this purpose. The banked 'compensation credits' are recognized by the regulatory agency as providing suitable compensation for wetland impacts... Because, in theory, banks are established prior to the occurrence of permitted impacts, there is a reduced temporal loss of wetland acreage or functions.

For the most part, the U.S. Army Corps of Engineers (Corps) oversees wetland mitigation banking for federal CWA purposes in conjunction with other federal, state, and local regulatory programs. In some circumstances, state or local agencies oversee wetland mitigation banking programs directly with little or no oversight by the Corps."[174]

"Federal guidance[175] on mitigation banking was released in 1995."[176] The Corps and the EPA issued guidance clarifying the Corps' policies and procedures regarding all compensatory mitigation proposals associated with permit applications.[177]

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[171] Although the "Federal Guidance for the Establishment, Use and Operation of Mitigation Banks" states that compensatory mitigation may be accomplished through the restoration, creation, enhancement, or in exceptional circumstances, preservation of wetlands, some states have been more restrictive and others less restrictive on what activities meet compensatory mitigation requirements. For example, Minnesota only allows restoration and creation, seven other states do not allow any preservation, and Louisiana allows preservation even in the absence of exceptional circumstances.

[172] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995.

[173] National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 83 [hereinafter NRC].

[174] Entire section in quotation marks is from: Environmental Law Institute, *Banks and Fees: The Status of Off-Site Wetland Mitigation in the United States,* 7-8 *available at* http://www.elistore.org/reports_detail.asp?ID=10695 (September 2002).

[175] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks, supra* note 5.

Wetland Mitigation Bank Establishment

"Although 1995 guidance states that mitigation banks can be established through the 'restoration, creation, enhancement, and in exceptional circumstances, preservation'[178] of wetlands, it makes it clear that restoration should be the first option for establishing a bank. Restoration is favored since, presumably, the correct hydrologic conditions are either in place or easily restorable. The 1995 guidance states, 'restoration should be the first option considered when siting a bank.'[179] Wetland creation is expressly discouraged because of 'continued uncertainty regarding the success of wetland creation or other habitat development.'[180] In addition, created wetlands often require hydrologic manipulations that may require on-going operation and maintenance. The 1995 guidance warns against over-engineered mitigation that is not self-sustaining.[181] Because creation and enhancement offer less assurance for providing functional equivalency and include tradeoffs in wetland functions, these mitigation approaches should only be used when there are 'adequate assurances to ensure success…'[182],,[183]

Enabling Instruments

"Mitigation banks must be recognized by the appropriate regulatory agencies with jurisdiction over wetlands activities before they can become fully operational. Since 1995, the procedure for establishing mitigation banks that are authorized by the Corps and used to mitigate for §404 permitted impacts has been guided by the 1995 guidance. The official sanction for these banks takes the form of a wetland banking instrument. For mitigation banks that are authorized by state or local regulatory agencies, this official sanction often takes the form of a permit or other enabling instrument…

Following issuance of the 1995 banking guidance, the first step for establishing a bank is for the prospective bank sponsor to submit a prospectus to the Corps (or NRCS where

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[176] Environmental Law Institute*, 2005 Status Report on Compensatory Mitigation in the United States (Apr. 2006), at* http://www.elistore.org/reports_detail.asp?ID=11137.

[177] U.S. Army Corps of Engineers and US Environmental Protection Agency. December 24, 2002. Guidance on Compensatory Mitigation Projects for Aquatic Resource Impacts Under the Corps Regulatory Program Pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. Regulatory Guidance Letter No. 02-2.

[178] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995.

[179] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995. II.B3. *See also*: National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 125.

[180] U.S. Environmental Protection Agency and U.S. Department of the Army. *Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines.* 1990. II.C (3).

[181] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995. *See also*: National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, D.C.: National Academy Press, 2001. 4.

[182] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995.

[183] Entire section in quotation marks is from: Environmental Law Institute, *Banks and Fees: The Status of Off-Site Wetland Mitigation in the United States,* 18 *available at* http://www.elistore.org/reports_detail.asp?ID=10695 (September 2002).

appropriate) to initiate the planning and review process. The details of what a bank prospectus should include are not outlined in the guidance. However, the 1995 guidance states that the documents should include "sufficient information concerning the objectives for the bank and how it will be established and operated."[184] The prospectus gives the regulatory agencies the ability to review the "general need for and technical feasibility" of the proposed bank.[185] The 1995 guidance established a new vehicle and process for approving wetland mitigation banks—the **mitigation banking instrument**. Banking instruments outline the establishment, operation, and maintenance of mitigation banks. Banking instruments are signed by the bank sponsor and the concurring regulatory and resource agencies that serve on the Mitigation Banking Review Team (see below).[186] According to the guidance, the following information should be included in the banking instrument:

- Bank goals and objectives;
- Ownership of bank lands;
- Bank size and classes of wetlands;
- Description of baseline conditions at the bank site;
- Geographic service area;
- Wetland classes or other aquatic resource impacts suitable for compensation;
- Methods for determining credits and debits;
- Accounting procedures;
- Performance standards for determining credit availability and bank success;
- Reporting protocols and monitoring plan;
- Contingency and remedial actions and responsibilities;
- Financial assurances;
- Compensation ratios; and
- Provisions for long-term management and maintenance.

In 1996, the Corps' Institute for Water Resources issued a Technical Paper, 'National Wetland Mitigation Banking Study: Model Banking Instrument.'[187] The model banking instrument details the structure and language of a model banking agreement. The Institute also issued a paper, designed to supplement the 1995 banking guidance that describes the planning process involved in establishing a wetland mitigation bank.[188],,[189]

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[184] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995. II.C.1.
[185] *Id.*
[186] *Id.* at II.C.2.
[187] Institute for Water Resources. *National Wetland Mitigation Banking Study: Model Banking Instrument*. Alexandria, VA: Institute for Water Resources, U.S. Army Corps of Engineers, May 1996. IWR Technical Paper WMB-TP-1. *See* <http://www.iwr.usace.army.mil/iwr/pdf/wmb_tp1_May96.pdf>.
[188] Institute for Water Resources. *Natinoal Wetland Mitigation Banking Study: Technical and Procedural Support to Mitigation Banking Guidance*. December 1995. IWR Technical Paper WMB-TP-2. *See* <http://www.iwr.usace.army.mil/iwr/pdf/wmb_tp2_Dec95.pdf>.
[189] Entire section in quotation marks is from: Environmental Law Institute, *Banks and Fees: The Status of Off-Site Wetland Mitigation in the United States,* 19-20 *available at* http://www.elistore.org/reports_detail.asp?ID=10695 (September 2002).

"In some cases, government development agencies, such as state transportation agencies, may foresee the need to establish multiple wetland mitigation banks or a regional banking program to compensate for anticipated wetland impacts. In such cases, umbrella agreements may be established. **Umbrella agreements** are banking instruments sponsored by a single entity to establish and operate a regional banking program with multiple bank sites.[190] The 1995 banking guidance offered this first definition of an umbrella instrument.

Umbrella agreements establish the parameters of the banking program. Supplemental information on the individual banks approved under the umbrella agreement is included in individual site plans that are submitted to the Mitigation Banking Review Team as the sites are identified. In general, statistics about bank sites established under umbrella agreements is difficult to obtain. The bank sponsor, rather than the Corps or state regulatory agency, often maintains this information. The sponsoring agency or the bank sponsor may maintain clear documentation of the number of sites with credits remaining. However, information about the total number of sites authorized under an umbrella agreement, the location of the sites and their acreage is often difficult to obtain."[191]

Bank Sponsor

"The **bank sponsor** is the entity, usually a government agency, private entrepreneur, or non-profit organization, responsible for credit production. Bank sponsors produce wetland credits on a specific site or sites by any of the accepted methods: restoration, creation, enhancement, or preservation. The bank sponsor acquires initial title or other right of entry to the proposed site, seeks preliminary approval from the regulatory agencies, and carries out the mitigation work. While some of these tasks may be contracted out or delegated, the bank sponsor bears primary financial and legal liability for successful construction and development of the mitigation site, and often for subsequent monitoring and maintenance.

The bank sponsor need not hold fee title to the mitigation site during bank establishment and credit sale. Bank sponsors can pay landowners, such as a state wildlife agency, county park, or private preserve owners, for the right to create credits on a specific parcel without assuming ownership. Bank sponsors must, however, have or demonstrate long-term (perpetual) control over the property. In some cases, the bank sponsor is the client. In other words, the agency or company seeking to satisfy compensatory mitigation requirements for permitted impacts seeks and gains approval for establishment of a bank. In most of these cases, the bank sponsor establishes the bank solely to satisfy its own current and future mitigation needs, rather than to make credits available to the public.

The bank sponsor is responsible for assuring that the bank meets the performance standards set forth in the banking instrument. The banking instrument generally outlines

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[190] *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks*. 60 Fed. Reg. 228, 58605-58614. 1995.

[191] Entire section in quotation marks is from: Environmental Law Institute, *Banks and Fees: The Status of Off-Site Wetland Mitigation in the United States,* 19-20 *available at* http://www.elistore.org/reports_detail.asp?ID=10695 (September 2002).

the maintenance, monitoring, and enforcement mechanisms that establish the responsibility of the bank sponsor to develop and operate the bank properly. Bank sponsors are also required to establish and maintain an accounting system that documents the activity of all mitigation bank accounts. The bank sponsor must submit documentation to the permitting agency when a debit or credit transaction occurs at the bank, as well as an annual ledger report for all mitigation bank accounts.[192]

The long-term property owner is the individual, agency, or organization that holds fee title to the bank site. Although the bank sponsor often holds fee title to the site during bank establishment and credit sale, long-term ownership of the site is often transferred to a public agency or non-profit organization, such as The Nature Conservancy, or a state wildlife agency. Long-term property owners may take responsibility for active monitoring and maintenance of the bank and financial liability for remedying mitigation failure or any damage to third parities. In other cases, this responsibility remains with the sponsor or with a third party entity. Bank sponsors are required to provide funds for long-term maintenance of the bank."[193]

Size of Bank

"The 1995 banking guidance established a preference for replacing small impacts with larger off-site mitigation banks. 'In general, use of a mitigation bank to compensate for minor aquatic resource impacts (e.g., numerous, small impacts associated with linear projects; impacts authorized under nationwide permits) is preferable to on-site mitigation.'[194] Federal policy has created a bias toward mitigating small impacts with large wetlands.

Increasingly, scientific evidence demonstrates that small isolated wetlands provide unique ecological and water quality functions. In addition, assemblage of small wetlands across a landscape may be equally important for many species. Scientists have suggested that wetland regulations should focus not just on wetland size, but also on local and regional wetland distribution when making permitting and mitigation decisions.[195]

The guidance does not specify minimum or maximum sizes of wetland mitigation banks, only that it must be considered in conjunction with location in relation to other ecological features."[196]

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[192] *Id.*

[193] Entire section in quotation marks is from: Environmental Law Institute, *Banks and Fees: The Status of Off-Site Wetland Mitigation in the United States,* 21 *available at* http://www.elistore.org/reports_detail.asp?ID=10695 (September 2002).

[194] 112 Federal Guidance for the Establishment, Use and Operation of Mitigation Banks. 60 Fed. Reg. 228, 58605-58614. 1995. II. D. 4.

[195] Semlitsch, Raymod D. "Size Does Matter: The Value of Small Isolated Wetlands." *National Wetlands Newsletter*. 22:1(2000). 46-59. NOTE: This article summarizes the findings of several scientific studies on the ecological importance of small, isolated wetlands.

[196] Entire section in quotation marks is from: Environmental Law Institute, *Banks and Fees: The Status of Off-Site Wetland Mitigation in the United States,* 28 *available at* http://www.elistore.org/reports_detail.asp?ID=10695 (September 2002).

State Regulatory Baseline

VIRGINIA[197]

The State Water Control Law provides statutory authority for the Virginia Water Protection (VWP) permit program, a state permit program for both tidal and nontidal wetlands administered by the Virginia Department of Environmental Quality (VA DEQ).[198] These permits must contain compensatory mitigation requirements that are sufficient to achieve "no net loss" of existing wetland acreage and function.[199]

Mitigation banks and in-lieu-fee programs have been legislatively authorized to meet compensatory mitigation requirements.[200] The VA DEQ is authorized to serve as a signatory on agreements governing the operation of wetlands mitigation banks. The courts of Virginia enforce the mitigation bank instrument and contracts for purchase of credits. An applicant may purchase credits from a bank in Virginia or in Maryland if the property is along the Potomac River.[201] Additionally, a mitigation bank may be utilized: if it is located in the same or adjacent U.S. Geological Survey Hydrological Unit Code (HUC) as the impacted site or meets prescribed certain conditions;[202] if it is ecologically preferable to practicable on-site and off-site mitigation options; and if the banking instrument has been approved by a process that included public review and comment. [203]

The VA DEQ regulations for the VWP permit program provide specific guidance for compensatory mitigation including VA DEQ approved mitigation banks and in-lieu fee programs.[204,205] Impacts from utility, public service, linear transportation projects, development, and mining projects to wetlands must be compensated by the following minimum ratios:

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[197] The text in this section "Virginia" is an updated version of the text originally published in: Environmental Law Institute, *State Wetland Program Evaluation: Phase III, available at* http://www.elistore.org/reports_detail.asp?ID=11215 (March 2007).
[198] 9 VA. ADMIN. CODE § 25-210.
[199] VA. CODE ANN. § 62.1-44.15:21B.
[200] VA. CODE ANN. §§ 62.1-44.15:23; 9 VA. ADMIN. CODE § 25-210-115 E.
[201] VA. CODE ANN. § 62.1-44.15:23A, B.
[202] VA. CODE ANN. § 62.1-44.15:23A (When the bank is not located in the same or adjacent hydrological unit as the impacted site, the purchase or use of credits shall not be allowed unless the applicant demonstrates that (i) the impacts will occur as a result of a Virginia Department of Transportation linear project; (ii) there is no practical alternative; (iii) the impacts are less than one acre; (iv) there is no significant harm to water quality or fish and wildlife resources due to the impacts; and either (v) impacts within the Chesapeake Bay watershed are mitigated within the Chesapeake Bay watershed or (vi) impacts within U.S.G.S. cataloging units 02080108, 02080208, and 03010205, as defined by the Hydrologic Unit Map of the United States (U.S.G.S. 1980), are mitigated in-kind within those hydrologic cataloging units, as close as possible to the impacted site.)
[203] VA. CODE ANN. § 62.1-44.15:23A.
[204] 9 VA. ADMIN. CODE §§ 25-210, 660, 670, 680, and 690.
[205] Virginia Department of Environmental Quality, *What is Compensatory Mitigation, at* http://www.deq.virginia.gov/wetlands/mitigate.html (last updated June 5, 2007).

- Impacts to forested wetlands shall be mitigated at 2:1, as calculated on an area basis.
- Impacts to scrub-shrub wetlands shall be mitigated at 1.5:1, as calculated on an area basis.
- Impacts to emergent wetlands shall be mitigated at 1:1, as calculated on an area basis.[206]

Compensation for conversion impacts to wetlands shall be mitigated at a 1:1 ratio for all of these permits.[207] VWP general permits for wetlands that are less than one acre, any permanent, unavoidable impacts must be compensated at a 2:1 ratio and conversion impacts to wetland must be compensated at a 1:1 ratio.[208] The VA DEQ and Corps Norfolk District have prepared a Wetland Mitigation Checklist, as well as technical guidelines[209] that include information on site design, example permit conditions for compensation, monitoring report criteria, and mitigation site compliance.[210] In regards to banking the guidelines state:

> [f]or mitigation banks, financial assurances (e.g. escrow account) shall be required sufficient to cover any advance credits that are released as well as long-term maintenance of the site and to address catastrophic impacts (flood, fire, drought, etc.) to the bank site. That portion of the assurances covering the advance release of credits shall be released once the advance credits are paid back (i.e. the equivalent acreage is successfully restored).[211]

The Virginia Marine Resources Commission (VMRC), which also has authority over tidal wetlands, has prepared a wetland mitigation policy and supplemental guidelines. The policy states that mitigation can include compensation through an approved mitigation bank or in-lieu-fee program.[212] Like with VWP permits, mitigation banks must be within the same for adjacent HUC.[213,214] The ratio of required compensation to

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[206] 9 VA. ADMIN. CODE §§ 25-670-70G; 25-680-70G; 690-70G.
[207] 9 VA. ADMIN. CODE §§ 25-670-70J; 25-680-70J; 25-690-70J.
[208] 9 VA. ADMIN. CODE §25-660-70E, -70H
[209] Norfolk District Corps and Virginia Department of Environmental Quality *Recommendations for Wetland Compensatory Mitigation*, *available at* http://www.deq.virginia.gov/wetlands/pdf/mitigationrecommendabbrevjuly2004.pdf (last accessed June 22, 2007).
[210] Norfolk District Corps and Virginia Department of Environmental Quality *Wetland Mitigation Checklist*. *Available at* http://www.nao.usace.army.mil/technical%20services/Regulatory%20branch/Guidance/Corps-DEQ_Mit_Checklist_7-04.pdf (last visited on June 22, 2007).
[211] Norfolk District Corps and Virginia Department of Environmental Quality *Recommendations for Wetland Compensatory Mitigation*, *available at* http://www.deq.virginia.gov/wetlands/pdf/mitigationrecommendabbrevjuly2004.pdf (last accessed June 22, 2007).
[212] 4 VA. ADMIN. CODE § 20-390-10 et. seq.
[213] 4 VA. ADMIN. CODE § 20-390-10C.
[214] VA. CODE ANN. § 28.2-1308 et. seq. (When the bank is not located in the same or adjacent hydrological unit as the impacted site, the purchase or use of credits shall not be allowed unless the applicant demonstrates that (i) the impacts will occur as a result of a Virginia Department of Transportation linear project; (ii) there is no practical alternative; (iii) the impacts are less than one acre; (iv) there is no significant harm to water quality or fish and wildlife resources due to the impacts; and either (v) impacts

the permitted loss must be determined by the VMRC or wetland board. They should use the Function Specific Credit Calculation Method[215] developed by the Virginia Institute of Marine Science (VIMS) and found in the *Guidelines for the Establishment, Use and Operation of Tidal Wetland Mitigation Banks in Virginia*.[216,217] In-lieu-fee programs must be selective as the last alternative to offset wetland loss. The applicant must show that there are no compensation options both on and off-site and that no mitigation banks are established within the watershed. In addition, in-lieu-fee programs must conform to the following requirements:

> [a]t the local level this could be the same fund established for the receipt of civil charges or civil penalties. Administration of such a fund should include an ability to trace the contribution of in-lieu fees to eventual use in actual wetland restoration or creation projects. If payments are made to other dedicated wetland restoration funds this should be recognized in the permit issued by the board. In no case should an in-lieu fee amount be accepted for less than the cost of necessary compensation acreage or the purchase of necessary credits in an approved bank. This is intended to prevent the avoidance of use of on-site or off-site compensation, or compensatory mitigation bank for a cheaper alternative that would not be able to fund the same level of wetland restoration or creation required by on-site or off site compensation or through use of a compensatory mitigation bank. Use of the fund could be for actual tidal wetland creation or restoration projects in the locality or for the purchase of credits in an approved compensatory mitigation bank that is authorized subsequent to the receipt of any in-lieu fee. Localities are encouraged to combine any in-lieu fee with other potential or available funds for wetland restoration or creation projects. [218]

The Virginia Mitigation Banking Review Team (MBRT) oversees mitigation bank permitting. Representatives include but are not limited to the Corps, VA DEQ, VMRC, VIMS and local wetland boards.[219] VA DEQ and the Corps take the lead on nontidal mitigation banking permits, while the VMRC and Corps take the lead on tidal mitigation banks. Currently, Virginia has 39 approved mitigation banks and approximately 6 proposed mitigation banks.[220] VMRC and VIMS, with assistance from the Mitigation

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within the Chesapeake Bay watershed are mitigated within the Chesapeake Bay watershed or (vi) impacts within U.S.G.S. cataloging units 02080108, 02080208, and 03010205, as defined by the Hydrologic Unit Map of the United States (U.S.G.S. 1980), are mitigated in-kind within those hydrologic cataloging units, as close as possible to the impacted site.)

[215] *See* Virginia Marine Resources Commission and Virginia Institute of Marine Science, *Guidelines for the Establishment, Use and Operation of Tidal Wetland Mitigation Banks in Virginia, Contract #CZM97-428-1, at* http://www.mrc.state.va.us/regulations/bankguide.shtm (last accessed June 21, 2007).

[216] 4 VA. ADMIN. CODE § 20-390-10C.

[217] Virginia Marine Resources Commission and Virginia Institute of Marine Science, *Guidelines for the Establishment, Use and Operation of Tidal Wetland Mitigation Banks in Virginia, Contract #CZM97-428-1, at* http://www.mrc.state.va.us/regulations/bankguide.shtm (last accessed June 21, 2007).

[218] 4 VA. ADMIN. CODE § 20-390-10D.

[219] Virginia Marine Resources Commission and Virginia Institute of Marine Science, *Guidelines for the Establishment, Use and Operation of Tidal Wetland Mitigation Banks in Virginia, Contract #CZM97-428-1, at* http://www.mrc.state.va.us/regulations/bankguide.shtm (last accessed June 21, 2007).

[220] U.S. Army Corps of Engineers, Norfolk District, *Mitigation Banking Links and Downloads-Operational Wetland Mitigation Banks, at* http://www.nao.usace.army.mil/technical%20services/Regulatory%20branch/Mitigation%20Banks/mitbanklist.asp#proposed (last updated March 2007).

Banking Advisory Committee,[221] private sector developers, consultants and environmental groups, have developed guidelines for the development and operation of tidal wetland mitigation banks in Virginia.[222] Additional guidelines for proposing mitigation banks have been developed jointly by the VA DEQ and the Corps Norfolk District.[223] Finally, the VA DEQ, in collaboration with the Corps, EPA, and FWS, has also developed a template to assist in developing a mitigation banking instrument.[224]

Contribution to an in-lieu-fee fund is authorized when on-site or off-site projects are deemed to be impracticable, provided that the fund is approved by the VA DEQ and is dedicated to the achievement of no net loss of wetland or stream acreage and function.[225] The Virginia Aquatic Resources Trust Fund, a cooperative partnership between The Nature Conservancy (TNC) and the Corps, is authorized by the VA DEQ as an acceptable form of compensatory mitigation for impacts to state waters, including wetlands, permitted under the VWP individual and general permits.[226] In addition, the Elizabeth River Restoration Trust (ERRT) was established under a 2003 memorandum of understanding signed by the VA DEQ, Corps, and The Elizabeth River Project.[227] The ERRT focuses on compensating for impacts within the Elizabeth River watershed. VA DEQ reviews the agreement on an annual basis to evaluate effectiveness of completed and proposed projects at offsetting impacts.

The Chesapeake Bay Preservation Act (Bay Act)[228] does not contain specific mitigation measures, but could impact the development of a mitigation bank. Under the Act, each of Virginia's 84 tidewater jurisdictions is required to designate Resource Protection Areas (RPAs) along the shorelines of streams, rivers, and other waterways, including tidal wetlands, and to regulate certain activities in those RPAs, such as building and tree cutting.[229] The Bay Act also establishes water quality protection measures specifically for the Chesapeake Bay, its tributaries, and other state waters, which include wetlands. The Chesapeake Bay Preservation Area Designation and Management Regulations, developed and administered by the Chesapeake Bay Local Assistance Board, outline

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[221] Virginia Marine Resources Commission, *Guidelines for the Establishment, Use and Operation of Tidal Wetland Mitigation Banks in Virginia, available at* http://www.mrc.state.va.us/regulations/fr391.shtm (last accessed June, 22 2007) (The Mitigation Banking Advisory Committee represents local, state and federal interests involved in tidal wetlands management and mitigation issues).
[222] *Id.*
[223] Virginia Department of Environmental Quality, *Suggestions for Proposing Mitigation Banks*, *available at* http://www.deq.virginia.gov/wetlands/pdf/mitigation.pdf (last accessed June 22, 2007).
[224] Virginia Department of Environmental Quality, *Template Mitigation Banking Instrument*, *available at* http:// www.deq.virginia.gov/wetlands/pdf/finalMBItemplateMay2004.pdf (last accessed June 22, 2007).
[225] 9 VA. ADMIN. CODE § 25-210-115 E.
[226] Letter from Dennis Treacy, State Water Control Board to Mr. J Robert Hume, Chief, Regulatory Branch, U.S. Army Corps of Engineers – Norfolk District (December 19, 2001), *available at* http:// www.deq.virginia.gov/wetlands/pdf/apprestfund.pdf.
[227] Memorandum of Understanding between The Elizabeth River Project, the Commonwealth of Virginia, and the U.S. Army Corps of Engineers – Norfolk District regarding the parameters for establishing a trust fund for mitigation of impacts, Elizabeth River Watershed (July 2003), *available at* http:// www.deq.virginia.gov/wetlands/pdf/eliztrustMOU.pdf.
[228] VA. CODE ANN. §§ 10.1-2100 – 2116.
[229] 9 VA. CODE ANN § 10-20-10 et seq *available at* http://www.cblad.virginia.gov/docs/Regs3-01-02.pdf.

criteria for implementation of the Bay Act.[230] Amendments to the regulations, implemented in 2001, require RPAs to be designated around all water bodies with perennial flow. A permit applicant must submit a Water Quality Impact Assessment for the review and approval of a local government to achieve compliance with the Bay Act. Chesapeake Bay Program regulations also establish 100-foot buffer zones in which shoreline development is regulated and limited.[231]

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WEST VIRIGNIA[232]

State-level wetland regulation is conducted through CWA §401 water quality certification. The West Virginia Department of Mining and Reclamation (DMR) oversees certification for all mining activities that affect jurisdictional wetlands, while the West Virginia Department of Waste Water Management (DWWM) oversees certification for all other activities. State regulations outline provisions for administering §401, including mitigation and an in-lieu fee program, but not mitigation banking.[233]

Compensatory mitigation provisions are outlined in the state's certification rules.[234,235] Where mitigation is necessary, on-site/in-kind mitigation is the first preference, followed by off-site/in-kind (preferably in the same watershed as the impacts), on-site/out-of-kind, and finally, off-site/out-of-kind.[236] The regulations also outline required ratios for impacts to various types of wetlands.[237] Ratios are the following:

- Impacts to open water wetlands are to be replaced at a ratio of one (1) unit created for each unit impacted.
- Impacts to emergent wetlands are to be replaced at a ratio of two (2) units created for each unit impacted.
- Impacts to scrub-shrub type wetlands are to be replaced at a ratio of three (3) units created for each unit impacted.
- Impacts to forested wetlands are to be replaced at a ratio of three (3) units created for each unit impacted.[238]

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[230] *Id.*
[231] *Id.*
[232] The text in this section "West Virginia" is an updated version of the text originally published in: Environmental Law Institute, *State Wetland Program Evaluation: Phase II*, *available at* http://www.elistore.org/reports_detail.asp?ID=11152 (June 2006).
[233] W. VA. CODE ST. R. § 47-5A.
[234] *See* W. VA. CODE ST. R. § 47-5A-6.
[235] West Virginia also requires mitigation for surface coal mining operations that affect more than 250 acres of watershed. Mitigation for temporary impacts is discretionary. W. VA. CODE § 22-11-7a.
[236] W. VA. CODE ST. R. § 47-5A-6.2.a.
[237] W. VA. CODE ST. R. § 47-5A-6.2.c.
[238] W. VA. CODE ST. R. §§ 47-5A-6.2.c.1 to §42-5A-6.2.c.4.

Acquisition of existing wetlands may be considered in certain instances and requires greater ratios.[239] Acquisition ratios are the following:

- Five (5) units to every one (1) unit for open body wetlands;
- Ten (10) units to every one (1) unit for wet meadow wetlands and;
- Fifteen (15) units to every one (1) unit for scrub-shrub and forested wetlands.[240]

Finally, the rules allow for in-lieu-fee mitigation and in-kind land donations if no other forms of mitigation are achievable.[241] For activities considered to be surface mining, money collected must be deposited into the Stream Restoration Fund (W. Va. Code ' 22-1-14) to restore and improve streams water resources of the state affected by mining. For in-lieu-fee programs, "permanent impacts for non-coal monetary mitigation will be assessed at the rate of $100.00 per lineal foot of stream lost, and $30,000 per acre of wetland replaced based on the ratios in section 6.2.c."[242] Monitoring is required for all mitigation sites until "success criteria outlined in the restoration plan" have been met, and monitoring reports must be submitted annually "until the project has been determined complete and successful for three concurrent years."[243] Both WVDEP and WVDNR must review and approve mitigation plans.[244]

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[239] W. VA. CODE ST. R. § 47-5A-6.2.6.c.
[240] W. VA. CODE ST. R. §§ 47-5A-6.2.6.c.5.i to 47-5A-6.2.6.c.5.iii.
[241] *See* W. VA. CODE ST. R. § 47-5A-6.2.d. Monies collected for impacts resulting from surface mining operations are deposited into the Stream Restoration Fund and used toward "restoration and enhancement of streams and water resources…which have been impacted by coal mining." Coal mining-related mitigation fees are assessed at $200,000 per acre of impact in watersheds larger than 250 acres from the toe of the farthest downstream permanent structure and/or watersheds with a 1/2-acre or greater loss or impact. W. VA. CODE ST. R. § 47-5A-6.2.d.1. Non-coal mining-related mitigation fees are assessed at $100 per lineal foot of impacted stream and $30,000 per acre of replaced wetland. W. VA. CODE ST. R. § 47-5A-6.2.d.2.
[242] W. VA. CODE ST. R § 47-5A-6.2.d.2.
[243] W. VA. CODE ST. R. § 47-5A-6.3.
[244] W. VA. CODE ST. R. § 47-5A-6.2.c.5.C.

MARYLAND[245]

Maryland's main state wetland laws (Non-Tidal Wetlands Protection Act and Tidal Wetlands Act) and regulations include general standards on mitigation, including banking and in-lieu fee.[246] When determining the type and amount of mitigation required of the permittee, MDE prefers in-ground, on-site mitigation projects. When that option is not feasible, the department evaluates off-site options, mitigation banks, and, lastly, payment into the State's Nontidal Wetland Compensation Fund for non-tidal wetlands, which MDE uses to conduct mitigation projects statewide.[247] It is important to note that buffer requirements are expanded to 100 feet for "nontidal wetlands of special State concern," which have been designated by regulation as having exceptional ecological or educational value.[248,249]

To establish a mitigation bank in Maryland for non-tidal wetlands a person must submit an application to the MDE. The application must include a mitigation plan,[250] and the MDE may post a public notice for banks with less than 5 acres of wetlands.[251] Once the application is approved, the MDE develops a Mitigation Banking Agreement, which may contain a variety of components, including construction plans, performance standards, remediation plans, etc.[252] Regulations also include requirements for the timing for sale of credits, reporting and accounting guidelines, remediation, and closing out banks.[253] Regulations also outline mitigation standards to achieve the state's no-net-loss policy for non-tidal wetlands, including ratios for compensation, location of mitigation, allowed enhancement procedures, project standards, and protection mechanisms.[254] Non-tidal mitigation bank operators must submit regular monitoring reports for five years.[255] Mitigation banking is also allowed for tidal wetlands and all banks must be approved in consultation with appropriate local, state, and federal authorities.[256]

It may be important to note that the Chesapeake and Coastal Bays Critical Area Act requires that local jurisdictions adopt zoning regulations for lands within 1,000 feet of the Chesapeake Bay or Coastal Bays in order to improve the water quality and habitat in the

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[245] The text in this section "Maryland" is an updated version of the text originally published in: Environmental Law Institute, *State Wetland Program Evaluation: Phase III, available at* http://www.elistore.org/reports_detail.asp?ID=11215 (March 2007).
[246] MD. CODE REGS. §§ 26.23.04.02 and 26.24.05.01.
[247] MD. CODE REGS. §§ 26.23.04.02; 26.24.05.01; 26.23.04.07.
[248] MD. CODE ANN., [ENVIR.]§§ 5-901—911
[249] Maryland Department of the Environment, *Wetland Regulations, at* http://www.mde.state.md.us/assets/document/wetlandswaterways/regulation.doc (last accessed June 22, 2007).
[250] A complete list of elements that must be included in a mitigation plan *see* MD. CODE REGS. § 26.23.04.06A(3).
[251] MD. CODE REGS. § 26.23.04.06B.
[252] For a complete list *see* MD. CODE REGS. § 26.23.06C(3).
[253] MD. CODE REGS. §§ 26.23.04.06D to 26.23.04.06G.
[254] MD. CODE REGS § 26.23.04.03 et. seq.
[255] MD. CODE REGS § 26.23.04.04
[256] MD. CODE REGS. § 26.23.05.01B(9). For all mitigation requirements in tidal wetlands *see* MD. CODE REGS § 26.23.05.01 et. seq.

Bay. Local jurisdictions must minimize alterations to the drainage area, surface and subsurface flow of water, and water quality to protect the hydrology and water quality of wetlands. Additionally, the act places restrictions on grading, filling, excavating, draining, flooding, and removing vegetation in nontidal wetlands.[257,258]

MDE recently completed a project funded by U.S. EPA to prioritize wetland areas for restoration, preservation, and mitigation in the state. MDE compiled information from resource inventories and management plans to create a comprehensive background document on wetlands and their surrounding environment. GIS and other data were used to identify desirable and undesirable locations for wetland work. The resulting document, *Prioritizing Sites for Wetland Restoration, Mitigation, and Preservation in Maryland*, also includes management and restoration recommendations based on input from counties, state agencies, and other interested parties. The May 2006 version of the report is available online.[259]

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[257] MD. CODE ANN., [NAT. RES.] § 8-1808
[258] Maryland Department of the Environment, *Wetland Regulations, at* http://www.mde.state.md.us/assets/document/wetlandswaterways/regulation.doc (last accessed June 22, 2007).
[259] Maryland Department of the Environment, *Prioritizing Areas for Wetland Restoration, Preservation, and Mitigation, at* http://www.mde.state.md.us/Programs/WaterPrograms/Wetlands_Waterways/about_wetlands/prioritizingareas.asp (last accessed June 22, 2007).

DELAWARE[260]

Delaware has no specific regulations or policies regarding wetland mitigation banking. However, Delaware protects tidal wetlands under the "Wetlands Act" [261] and submerged lands and tidelands under the "Subaqueous Land Act," [262] and Delaware's Regulations Governing the Control of Water Pollution do outline guidelines for compensatory mitigation under the water quality certification program.[263] These regulations allow creation and restoration as well as mitigation banks. Preference is stated for compensation that is on site and within the same watershed as the impacted water and that is completed prior to impacts.[264] Preferred compensation ratios are not to exceed a ratio of three times the area of impacted waters. Conservation easements, monitoring, functional assessment, maintenance and reporting programs may be required on mitigated wetlands. Subaqueous Land regulations state that losses to public resources must be offset or mitigated,[265] and mitigation measures may be incorporated into the terms of the permit or lease.[266]

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PENNSYLVANIA[267]

Pennsylvania has no specific regulations, policies, or guidelines for wetland mitigation banking. However, the state has guidance for compensatory mitigation, established banks, and an in-lieu fee program. It also participates on the Mitigation Banking Review Team.

Wetlands have been regulated since 1980 under the Dam Safety and Encroachments Act.[268] Regulatory provisions include permitting criteria and wetland mitigation and replacement requirements. Specifically, regulations list "wetland replacement criteria" that outline acreage and functional replacement requirements,[269] as well as siting

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[260] The text in this section "Delaware" is an updated version of the text originally published in: Environmental Law Institute, *State Wetland Program Evaluation: Phase IV, available at* http://www.elistore.org/reports_detail.asp?ID=11256 (October 2007).

[261] 7 Del.C. Chapter 66

[262] 7 Del.C. Chapter 72

[263] Regulations Governing the Control of Water Pollution et seq.

[264] Regulations Governing the Control of Water Pollution § 5.10(7)(C).

[265] 7 Del. C Chapter 72.2.03

[266] 7 Del. C. Chapter 72.3.01.B.4.

[267] The text in this section "Pennsylvania" is an updated version of the text originally published in: Environmental Law Institute, *State Wetland Program Evaluation: Phase I, available at* http://www.elistore.org/reports_detail.asp?ID=11079 (January 2005).

[268] 32 PA. CONS. STAT. §§ 693.1–693.27.

[269] Acreage and functions and values must be replaced at a minimum of 1:1 (replacement acres to acres affected), but PADEP may require a higher ratio depending on the circumstances of the project and the wetlands being affected. For activities constructed without a permit and for which mitigation cannot be achieved, the required replacement ratio is 2:1 (replacement acres to acres affected), but, again, PADEP

requirements.[270] In addition, the regulations cite Pennsylvania Department of Environmental Protection (PADEP) guidelines, entitled *Design Criteria for Wetlands Replacement*.[271] The guidelines, written to provide "design, flexibility, and utilization of the best available technology in environmental engineering," give a general overview of mitigation objectives and provide guidance for site selection and construction.[272] In evaluating wetland replacement, the PADEP will use these guidelines.[273] Regulations for mining requires that wetlands be created or restored as opposed to drained or permanently destroyed.[274]

PADEP established the Pennsylvania Wetland Replacement Project (PWRP) in 1996. Through the PWRP, permit applicants who are impacting one-half acre of wetland or less and have no on-site wetland replacement options or alternative mitigation opportunities may contribute money into a PADEP-managed in-lieu-fee fund. Monies from the fund are then used to support the restoration of wetlands on private lands within the watershed.[275] PADEP staff conduct on-site assessments in cooperation with landowners, provide project design assistance and construction oversight, and conduct annual site visits to quantitatively monitor project success. Since 1996, approximately 530 contributions from applicants contributing approximately $1.4 million to the PWRP, offsetting approximately 93 acres of impacted wetland. In addition, approximately 570 individually authorized permit actions, involving less than 0.05 acres of wetland each, have resulted in a cumulative total of 15.8 acres of wetland impact statewide. These "de-minimus" impacts are also replaced by PADEP through the PWRP. During the life of the PWRP, PADEP has assisted, funded, or participated in the restoration of roughly 128 acres of wetland.[276]

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may require a higher ratio depending on the circumstances of the project and the wetlands being affected. 25 PA. CODE § 105.20(a).

[270] Regulations require that mitigation must occur adjacent to the impact site, unless an alternative site is approved by the PADEP. Alternative sites should be located in the same watershed or coastal zone as the impacted wetland. 25 PA. CODE § 105.20(a).

[271] PA DEP, *Design Criteria for Wetlands Replacement, available at* http://www.dep.state.pa.us/dep/deputate/watermgt/wc/subjects/wwec/general/wetlands/wetlands.htm (click on title at bottom of page) (last accessed June 22, 2007).

[272] 25 PA. CODE § 105.20(a).

[273] 25 PA. CODE § 105.20(b).

[274] 25 PA. CODE § 87.138(a)(7).

[275] Personal Communication with Ken Reisinger, Pennsylvania Department of Environmental Protection (Oct. 7, 2004).

[276] Communication with Kenneth Murin, Pennsylvania Department of Environmental Protection (Apr. 30, 2004).

NEW YORK[277]

Wetlands in New York are regulated under the Freshwater Wetlands Act, Tidal Wetlands Act, and Water Resources Law. These laws do not explicitly establishing a mitigation program. Mitigation is, however, addressed in the state's regulations (Title 6 of the NYCRR, Part 661 and 663). In order to receive a permit from the New York Department of Environmental Conservation (NY DEC) or the Adirondack Park Agency (APA) (NY DEC/ Division of Fish, Wildlife, and Marine Resources (DFWMR) regulates all wetlands outside of the Adirondack Park and the APA regulates all wetlands within the park) under the Freshwater or Tidal Wetlands Acts, an applicant must demonstrate that impacts to the wetland cannot be avoided, that the unavoidable impacts have been minimized to the fullest extent, and finally, that they will fully compensate for or replace "any remaining loss of wetland acreage and function unless it can be shown that the losses are inconsequential or that, on balance, economic or social need for the project outweighs the losses."[278] Compensatory mitigation for 'unavoidable impacts' to a wetland must occur on or in the vicinity of the proposed project, must fall under the authority of the regulating agency after the mitigative measures have been completed, and must provide substantially equal or increased benefits to those of the lost wetland.[279]

The NYS DEC has developed general mitigation guidelines for its regulating staff. The guidelines do not prescribe a "cookbook" approach for wetlands mitigation, but instead offer a framework for decision-making related to wetlands regulation and enforcement.[280] Guiding principles include the following:

- Priority requirements are to first avoid and then minimize project impacts;
- Compensatory mitigation should preferably be on-site and in-kind;
- The preferred order of mitigation approaches is wetland restoration, then creation, then enhancement;
- Mitigation proposals should be based on plans containing clear specific detail, short and long term goals, and measurable performance criteria;
- Replacement at a 1:1 ratio is desirable;
- Mitigation should be sustainable and must persist over time without intensive, long term maintenance;
- Projects should be monitored for an appropriate period of time, as determined on a case-by-case basis;
- Mitigation should be completed prior to or concurrent with the permitted project; and

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[277] The text in this section "New York" is an updated version of the text originally published in: Environmental Law Institute, *State Wetland Program Evaluation: Phase I, available at* http://www.elistore.org/reports_detail.asp?ID=11079 (January 2005).

[278] New York Department of Environmental Conservation, *Freshwater Wetlands Regulation - Guidelines on Compensatory Mitigation*, *at* http://www.dec.ny.gov/docs/wildlife_pdf/wetlmit.pdf (Last accessed June 22, 2007).

[279] N.Y. COMP. CODES R. & REGS. tit. 6, § 663.

[280] NY DEC, *supra* note 102.

- Joint mitigation projects and mitigation banking can be considered by permitting staff.[281]

The NYS DEC is involved in mitigation banking efforts. The agency issued a memorandum to its field staff advising them to consider banking as mitigation option equivalent to other off-site mitigation for freshwater wetlands [included as attachment].[282]

The APA generally reviews mitigation plans as part of the wetlands permitting process in cases where impacts to wetlands cannot be avoided, as well as mitigation resulting from enforcement activities. In 1995, the agency adopted general mitigation guidelines that, similar to the NYS DEC guidelines, recognize banking and in-lieu-fee as mitigation options, but do not prescribe specific methods for either.[283]

Point of Contact
Patricia Riexinger, Freshwater Wetlands Program Manager, Department of Environmental Conservation – Division of Fish, Wildlife and Marine Resources
518-402-8848/ pxriexin@gw.dec.state.ny.us

WASHINGTON, DC
The mayor of Washington, DC may allow certain discharges into district waters and wetlands. Dredge and fill may be discharged into DC waters, if the discharge does not impact habitat and fish migration. For any impacts or destruction to wetlands from discharge of dredge and fill material, habitat impacts must be mitigated "to the extent the Mayor requires through onsite or offsite replacement of the habitat or through payment of an amount determined by the Mayor that shall be deposited into the fund [the District of Columbia Stream and Wetland Mitigation Trust Fund].[284] The mayor administers the District of Columbia Stream and Wetland Mitigation Trust Fund (Wetland Fund), which is used to create, restore, and enhance wetlands.[285]

Environmental regulations are not available online.

Point of Contact
Diane Douglas, District Department of the Environment – Water Quality Division
202-535-2641

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[281] *Id.*
[282] Memorandum from Patricia Riexinger, New York Department of Environmental Conservation, Division of Fish, Wildlife and Marine Resources, Bureau of Habitat, to Natural Resource Supervisors, New York Department of Environmental Conservation (Dec. 24, 2002) (on file with author).
[283] Personal communication with Dan Spada, New York Adirondack Park Agency (May 10, 2004).
[284] D.C. CODE ANN. § 8-103.06(a)(3)(B).
[285] D.C. CODE ANN. § 8-103.09(d)(1).

Additional Federal Regulatory and Policy Information[286]

1980 §404(b)(1) Guidelines

- Regulations issued by EPA that constitute the substantive environmental criteria used by the Corps in evaluating activities regulated under §404 of the Clean Water Act.
- U.S. Environmental Protection Agency. 1980. *Guidelines for Specification of Disposal Sites for Dredged or Fill Material.* Federal Register. Vol. 45, No. 249: 85336-85357.
- http://www.epa.gov/owow/wetlands/pdf/40cfrPart230.pdf

1990 Memorandum of Agreement

- Agreement between EPA and the Corps outlining the policy and procedures to be used in determining the type and level of mitigation necessary to demonstrate compliance with the §404(b)(1) Guidelines.
- U.S. Environmental Protection Agency and U.S. Department of the Army. February 6, 1990. *Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines*.
- http://www.epa.gov/owow/wetlands/regs/mitigate.html

1995 Mitigation Banking Guidance

- Interagency guidance issued to clarify the manner in which mitigation banks may be established, used, and operated to satisfy the compensatory mitigation requirements of the §404 program.
- Department of Defense, Environmental Protection Agency, Department of Agriculture, Department of the Interior, and Department of Commerce. 1995. *Federal Guidance for the Establishment, Use and Operation of Mitigation Banks.* Federal Register. Vol. 60, No. 228. 58605-58614. Tuesday, November 28, 1995.
- http://www.epa.gov/owow/wetlands/guidance/mitbankn.html

1998 Corps Guidance on the Use of Mitigation Banks in Civil Works Projects

- Implementation guidance issued by the Corps on the use of mitigation banks in Corps Civil Works projects.
- U.S. Army Corps of Engineers. April 22, 1998. *Use of Mitigation Banks for U.S. Army Corps of Engineers Civil Works Projects*. Policy Guidance Letter (PGL) No. 46.
- http://www.usace.army.mil/cw/cecw-p/pgls/pgl46b.pdf

[286] Wilkinson, Jessica and Jared Thompson. Session 1 Overview of Federal Mitigation Banking Policy: Summary of Key Federal Compensatory Mitigation Policy and Other References. Materials developed for *A Training Course on Interagency Mitigation Bank Review Teams,* delivered in June 2007.

1999 Fish and Wildlife Service Policy on Wildlife Refuges and Compensatory Mitigation

- Guidelines issued by the Fish and Wildlife Service regarding siting compensatory mitigation projects conducted under §404 on lands in the National Wildlife Refuge System.
- U.S. Fish and Wildlife Service. September 10, 1999. *Final Policy on the National Wildlife Refuge System and Compensatory Mitigation Under the Section 10/404 Program.* Federal Register. Vol. 64, No. 175: 49229-49234.
- http://www.fws.gov/habitatconservation/Refuge%20Mitigation%20Policy%201999FR.pdf

2000 In-Lieu-Fee Guidance

- Interagency guidance issued to clarify the agencies' policy on the manner in which in-lieu-fee mitigation may be used to satisfy compensatory mitigation requirements.
- U.S. Department of the Army, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration. October 31, 2000. *Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act*.
- http://www.epa.gov/owow/wetlands/pdf/inlieufee.pdf

2002 Mitigation Regulatory Guidance Letter 02-2

- Guidance issued by the Corps and EPA clarifying the Corps' policies and procedures regarding all compensatory mitigation proposals associated with permit applications.
- U.S. Army Corps of Engineers and US Environmental Protection Agency. December 24, 2002. *Guidance on Compensatory Mitigation Projects for Aquatic Resource Impacts Under the Corps Regulatory Program Pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899*. Regulatory Guidance Letter No. 02-2.
- http://www.usace.army.mil/cw/cecwo/reg/rgls/RGL2-02.pdf

2002 National Mitigation Action Plan

- An interagency plan endorsing the goal of no net loss of wetlands and outlining specific action items that address the concerns of the NAS, GAO, and other independent evaluations.
- Department of the Army, Environmental Protection Agency, Department of Commerce, Department of Interior, Department of Agriculture, Department of Transportation. December 24, 2002. *National Mitigation Action Plan.*
- http://www.mitigationactionplan.gov/map.html

2003 Guidance on the Use of the TEA-21 Preference for Mitigation Banking

- Guidance issued by EPA, Department of the Army, and Federal Highway Administration on applying the preference for wetlands mitigation banking

mandated in the Transportation Equity Act for the 21st Century (TEA-21) to compensatory mitigation requirements under §404.

- Department of the Army, Federal Highway Administration, and U.S. Environmental Protection Agency. July 11, 2003. *Federal Guidance on the Use of the TEA-21 Preference for Mitigation Banking to Fulfill Mitigation Requirements Under Section 404 of the Clean Water Act.*
- http://www.epa.gov/owow/wetlands/pdf/TEA-21Guidance.pdf

2003 Interagency Memorandum of Agreement on Protecting Aviation from Wildlife Hazards

- A Memorandum of Agreement signed by the Federal Aviation Administration, U.S. Air Force, Department of the Army, EPA, U.S. Fish and Wildlife Service, and U.S. Department of Agriculture establishing procedures to coordinate efforts to minimize wildlife risks to aviation and human safety, while protecting natural resources.
- Federal Aviation Administration, U.S. Air Force, Department of the Army, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and U.S. Department of Agriculture. July 2003. *Memorandum of Agreement Between the Federal Aviation Administration, the U.S. Air Force, the U.S. Army, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture to Address Aircraft-Wildlife Strikes.*
- http://www.mitigationactionplan.gov/moa.pdf

2003 Operational Guidelines for Creating or Restoring Self-Sustaining Wetlands

- Memorandum to the field issued by the Corps that identifies basic requirements for planning and siting successful mitigation projects.
- U.S. Army Corps of Engineers. October 29, 2003. *Model "Operational Guidelines for Creating or Restoring Wetlands that are Ecologically Self-Sustaining" for Aquatic Resource Impacts Under the corps Regulatory Program Pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.* Memorandum to the Field.
- http://www.mitigationactionplan.gov/nas404program.pdf

2003 Model Compensatory Mitigation Plan Checklist

- Memorandum to the field issued by EPA and the Corps that includes a model compensatory mitigation plan checklist and supplemental materials to guide permit applicants preparing compensatory mitigation plans.
- U.S. Army Corps of Engineers and U.S. Environmental Protection Agency. November 7, 2003. *Model Compensatory Mitigation Plan Checklist for Aquatic Resource Impacts Under the Corps Regulatory Program Pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.* Memorandum to the Field.
- http://www.mitigationactionplan.gov/checklist.pdf

2004 Federal Aviation Administration Advisory Circular

- Guidance issued by the Federal Aviation Administration on locating land uses, including wetland compensatory mitigation sites, which have the potential to attract hazardous wildlife to or in the vicinity of public-use airports.
- U.S. Department of Transportation, Federal Aviation Administration. July 7, 2004. *Advisory Circular: Hazardous Wildlife Attractants On or Near Airports.* AC No: 150/5200-33A.
- http://www.faa.gov/airports_airtraffic/airports/resources/advisory_circulars/media/150-5200-33A/150_5200_33a.pdf

2006 Minimum Monitoring Requirements Regulatory Guidance Letter 06-03

- Guidance issued by the Corps to the Districts and the regulatory community on minimum monitory requirements for compensatory mitigation projects, as well as the required content of monitoring reports.
- U.S. Army Corps of Engineers. August 3, 2006. *Minimum Monitoring Requirements for Compensatory Mitigation Projects Involving the Creation, Restoration, and/or Enhancement of Aquatic Resources.* Regulatory Guidance Letter No. 06-03.

http://www.usace.army.mil/cw/cecwo/reg/rgls/rgl06_03.pdf

2007 U.S. Army Corps of Engineers/Environmental Protection Agency Joint Guidance Document on *Rapanos*

http://www.epa.gov/EPA-WATER/2007/June/Day-08/w11123.htm

SUMMARY TABLE OF WETLANDS BANKING AND IN-LIEU FEES

VIRGINIA

Wetlands Banking	**Regulatory Drivers**	State Water Control Law	VA. CODE ANN. §§ 62.1-44.15:5 to 62.1-44.34:28
		Virginia Wetlands Tidal Act	VA. CODE ANN. § 28.2-1300 to 1320
		Non-tidal Wetlands Act	VA. CODE ANN. § 62.1-44.15:5
		Virginia Wetlands Permit regulations	9 VA. ADMIN. CODE § 25-210
	Transaction requirements	Before opting to purchase wetland bank credits, all avoidance and minimization options must be exhausted by a project applicant. Bank credits may only be purchased if it is ecologically preferable to on-site or off-site mitigation options. Generally, the preference for mitigation is "restoration, creation, mitigation banking, in-lieu fee fund;"[287] however, decisions are made on a case by case basis. Prior to purchasing credits an alternatives analysis must be conducted.[288] The banking instrument must be approved by a process that involves public notice and comment. Credits also must be purchased from a bank within the same Hydrological Unit Code (HUC) as the impact or the applicant demonstrates the following: (i) the impacts will occur as a result of a Virginia Department of Transportation linear project; (ii) there is no practical alternative; (iii) the impacts are less than one acre; (iv) there is no significant harm to water quality or fish and wildlife resources due to the impacts; and either (v) impacts within the Chesapeake Bay watershed are mitigated within the Chesapeake Bay watershed or (vi) impacts within U.S.G.S. cataloging units 02080108, 02080208, and 03010205, as defined by the Hydrologic Unit Map of the United States (U.S.G.S. 1980), are mitigated in-kind within those hydrologic cataloging units, as close as possible to the impacted site. *See* Vir. Code Ann. § 62.1-44.15:5 "Understand that a Mitigation Bank Review Team (MBRT) must be formed and the Mitigation Banking Instrument (MBI) must be signed, financial assurances must be in place, and any deed restrictions or conservation easements must be recorded prior to the release or sale of any credits." http://www.deq.state.va.us/wetlands/pdf/mitigation.pdf
	Bank specifics	***Credit Valuation and Number:*** Banks generally determine the number of credits they will sell based on some standard of functional equivalency, acreage, best professional judgment, or a combination of several techniques.[289] For tidal wetlands the Function Specific Credit Calculation methods should be used.

[287] 9 Va. Admin. Code § 25-210-115C
[288] *Id.* §25-210-115D.
[289] Banks and Fees

Credit ratios:

- Impacts to forested wetlands shall be mitigated at 2:1, as calculated on an area basis.
- Impacts to scrub-shrub wetlands shall be mitigated at 1.5:1, as calculated on an area basis.
- Impacts to emergent wetlands shall be mitigated at 1:1, as calculated on an area basis.[290]

Compensation for conversion impacts to wetlands shall be mitigated at a 1:1 ratio for all of these permits.[291] VWP general permits for wetlands that are less than one acre, any permanent, unavoidable impacts must be compensated at a 2:1 ratio.

Credit release and financial assurances: Advance credits may be released. "For mitigation banks, financial assurances (e.g. escrow account) shall be required sufficient to cover any advance credits that are released as well as long-term maintenance of the site and to address catastrophic impacts (flood, fire, drought, etc.) to the bank site. That portion of the assurances covering the advance release of credits shall be released once the advance credits are paid back (i.e. the equivalent acreage is successfully restored)."[292]

Credit verification: Project applicant provides verification to VA DEP that the required amount of credits were purchased.

Performance Standards: VMRC and VIMS have standards in their *Guidelines for the Establishment, Use and Operation of Tidal Wetland Mitigation Banks in Virginia.*[293]

Monitoring Protocol:

Maintenance and Management:
MBRT: In Virginia, the MBRT oversees mitigation banking permitting.

Buyers and sellers

Buyers: Department of Transportation, VWP permit holders, §404 permittees, state agencies, utilities, land developers[294]
Sellers: Banks are both privately and publicly owned in Virginia. Bank-ownership ranges from state agencies to non-profits to private

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[290] 9 VA. ADMIN. CODE §§ 25-670-70G; 25-680-70G; 690-70G.
[291] 9 VA. ADMIN. CODE §§ 25-670-70J; 25-680-70J; 25-690-70J.
[292] Norfolk District Corps and Virginia Department of Environmental Quality *Recommendations for Wetland Compensatory Mitigation*, *available at* http://www.deq.virginia.gov/wetlands/pdf/mitigationrecommendabbrevjuly2004.pdf (last accessed June 22, 2007).
[293] Virginia Marine Resources Commission and Virginia Institute of Marine Science, *Guidelines for the Establishment, Use and Operation of Tidal Wetland Mitigation Banks in Virginia, Contract #CZM97-428-1, at* http://www.mrc.state.va.us/regulations/bankguide.shtm.
[294] VA. CODE ANN. §§ 62.1-44.15:23

		companies.
	Geographic extent	Usually set forth in the banking instrument. In Virginia, banks cover specific HUCs.
	Flow of capital	Regulated entity to bank
	Mitigation Guidance	Recommendations for Wetland Compensatory Mitigation;[295] Wetland Mitigation Checklist; Guidelines for the Establishment,[296] Use and Operation of Tidal Wetland Mitigation Banks in Virginia[297]
	Existing/ Proposed Banks	Virginia has 39 active wetland/ stream mitigation banks.[298] As of 2005, Virginia also had one umbrella banking agreement (s*ee* attached Wetland Mitigation Banks in the Chesapeake Bay States).
In-lieu Fee	**Summary**	Payments into an in-lieu fee program must be considered as a last option for tidal wetlands. Specific guidelines for in-lieu fee programs for tidal wetlands specify that all funds should be able to trace contributions to actual wetland restoration or creation projects. In addition, payment amounts must not be less than the cost to compensate the acreage lost or the purchase of credits from a wetland

[295] Norfolk District Corps and Virginia Department of Environmental Quality *Recommendations for Wetland Compensatory Mitigation*, *available at* http://www.deq.virginia.gov/wetlands/pdf/mitigationrecommendabbrevjuly2004.pdf.

[296] Norfolk District Corps and Virginia Department of Environmental Quality *Wetland Mitigation Checklist*. *Available at* http://www.nao.usace.army.mil/technical%20services/Regulatory%20branch/Guidance/Corps-DEQ_Mit_Checklist_7-04.pdf.

[297] Virginia Marine Resources Commission and Virginia Institute of Marine Science, *Guidelines for the Establishment, Use and Operation of Tidal Wetland Mitigation Banks in Virginia, Contract #CZM97-428-1, at* http://www.mrc.state.va.us/regulations/bankguide.shtm.

[298] U.S. Army Corps of Engineers, Norfolk District, *Mitigation Banking Links and Downloads-Operational Wetland Mitigation Banks, at* http://www.nao.usace.army.mil/technical%20services/Regulatory%20branch/Mitigation%20Banks/mitbanklist.asp#proposed (last updated March 2007).

[299] 4 VA. ADMIN. CODE § 20-390-10D.

	mitigation bank.[299] All in-lieu fee funds that are acceptable under the VWP individual and general permits must be approved by the VA DEQ and dedicated to the no net loss of wetland or stream function and acreage.[300] The Virginia Aquatic Resources Trust Fund, a cooperative partnership between The Nature Conservancy (TNC) and the Corps, is authorized by the VA DEQ as an acceptable form of compensatory mitigation for impacts to state waters, including wetlands, permitted under the VWP individual and general permits.[301] VA DEQ, TNC and the Corps have monthly meetings to review current and potential Trust Fund projects and to address any concerns conveyed by a state or federal agency.[302] TNC proposes projects to be funded by the Trust Fund. In addition, the Elizabeth River Restoration Trust (ERRT) was established under a 2003 memorandum of understanding signed by the VA DEQ, Corps, and The Elizabeth River Project.[303] The ERRT focuses on compensating for impacts within the Elizabeth River watershed. VA DEQ reviews the agreement on an annual basis to evaluate effectiveness of completed and proposed projects at offsetting impacts. Project proposals are chosen for funding based on the Elizabeth River Project Watershed Action Plan. Priorities include the "purchase, protection, restoration, and/ or creation of wetlands, mud flats, oyster reeds, and other aquatic resources; the purchase, protection, and restoration of upland buffers adjacent to aquatic resources; restoration or remediation of contaminated river bottoms, including restoration of contaminated uplands located adjacent to, and affecting aquatic resources of Elizabeth River; and reduction of toxic, nutrient laden, or other undesirable stormwater runoff"[304] (*see* attached In-Lieu Fee Programs in the Chesapeake Bay States).
Geographic extent	Virginia Aquatic Resources Trust Fund – The fund cannot be used in areas where there are approved wetland mitigation banks with available credits. Elizabeth River Restoration Fund – tidal submerged lands and wetlands within the entire Elizabeth River Watershed.

[300] 9 Va. Admin. Code § 25-210-115E.
[301] Letter from Dennis Treacy, State Water Control Board to Mr. J Robert Hume, Chief, Regulatory Branch, U.S. Army Corps of Engineers – Norfolk District (December 19, 2001), *available at* http:// www.deq.virginia.gov/wetlands/pdf/apprestfund.pdf.
[302] David Davis, *supra* note 59.
[303] Memorandum of Understanding between The Elizabeth River Project, the Commonwealth of Virginia, and the U.S. Army Corps of Engineers – Norfolk District regarding the parameters for establishing a trust fund for mitigation of impacts, Elizabeth River Watershed, *available at* http:// www.deq.virginia.gov/wetlands/pdf/eliztrustMOU.pdf (last visited March 21, 2007).
[304] Elizabeth River Restoration Trust, Virginia Department of Environmental Quality, and the U.S. Army Corps of Engineers, Elizabeth River Restoration Trust Operation Agreement, *available at* http://www.deq.state.va.us/wetlands/pdf/eliztrustoperatingagree.pdf (May 2004).

WEST VIRGINIA

Wetland Banking	**Summary**	West Virginia's regulations relating to §401 certifications authorizes mitigation and payments into in-lieu fee funds for impacts to wetlands. Wetlands mitigation banking is not authorized.[305]	
	Existing/ Proposed Banks	As of 2005, one wetland mitigation bank was pending (s*ee* attached Wetland Mitigation Banks in the Chesapeake Bay States).	
In-lieu Fee	**Summary**	Payments into an in-lieu fee fund are allowed as a form of mitigation are achievable. "Permanent impacts for non-coal monetary mitigation will be assessed at the rate of $100.00 per lineal foot of stream lost, and $30,000 per acre of wetland replaced based on the ratios in section 6.2.c."[306] Monitoring is required for all mitigation sites until "success criteria outlined in the restoration plan" have been met, and monitoring reports must be submitted annually "until the project has been determined complete and successful for three concurrent years."[307] Both WVDEP and WVDNR must review and approve mitigation plans.[308] As of 2005, West Virginia had one in-lieu fee program administered by the WVDEP (*see* attached In-Lieu Fee Programs in the Chesapeake Bay States).	
	Regulatory Drivers	Water Pollution Control Act	W.VA CODE § 22-11 et. seq. (22-11-7A)
		§ 401 certification regulations	W. VA. CODE § 47-5A et. seq.
	Geographic extent	No specification in statutes.	

[305] W. VA. CODE ST. R. § 47-5A.
[306] W. VA. CODE ST. R § 47-5A-6.2.d.2.
[307] W. VA. CODE ST. R. § 47-5A-6.3.
[308] W. VA. CODE ST. R. § 47-5A-6.2.c.5.C.

MARYLAND

Wetlands Banking	**Regulatory Drivers**	Non-tidal Wetlands Protection Act	MD. CODE ANN., ENVIR. § 5-901—911
		Tidal Wetlands Protection Act	MD. CODE ANN., ENVIR. §§ 16-101–16-503
		Water Pollution Act	MD. CODE ANN., ENVIR. §§ 9-313—9-316, 9-319, 9-320, and 9-325
		Chesapeake and Coastal Bays Critical Area Act	MD. CODE ANN., NAT. RES. § 8-1808
		Non-tidal wetland regulations	MD. CODE REGS. §§ 26.23.01 to 26.23.06
		Tidal wetland regulations	MD. CODE REGS. §§ 26.24.01 to 26.24.05
	Transaction requirements	***Nontidal wetlands:*** An application that includes a mitigation bank concept plan must be submitted to the Maryland Department of the Environment (MDE). Plans must include the following: "(a) Drawings at a scale equal to 1 inch equals 200 feet or other scale approved by the Department, and showing existing topography, nontidal wetland boundaries and buffers, and 100-year floodplain boundaries, if applicable; (b) A vicinity map of the proposed mitigation bank site; (c) Proposed acreage and type of nontidal wetlands to be established in the bank; (d) A description of methods of establishment of nontidal wetlands; (e) The proposed water source; (f) A description of proposed earth disturbance necessary; (g) A preliminary assessment of impact, if any, on existing nontidal wetlands, buffers, and 100-year floodplains; (h) A proposed mechanism to protect the mitigation bank site in perpetuity, including easements, covenants, deed restrictions, or similar means approved by the Department; (i) As applicable, information regarding consistency with natural resource management plans, approved watershed plans, forest conservation, local growth management policies, and local comprehensive plans."[309] Once application is approved, the MDE develops a Mitigation Banking Agreement. Use of credits must be approved by the MDE.[310] ***Tidal Wetlands:*** Mitigation banks may be created; however, regulations provide no specifics regarding requirements for tidal wetlands mitigation banks.
	Bank specifics	***Credit Valuation and Number:*** The means for determining acreage and value of credits will be identified in mitigation bank concept plans. Credit value is in acres. ***Credit release:*** Credit operators may decide when to release credits; however, this does not mean that they are approved by the MDE for use

[309] MD. CODE REGS. §§ 26.23.04.06A.
[310] MD. CODE REGS. §§ 26.23.01.01B(60).

	in specific projects. The MDE also may require that only half the credits be sold in the first two growing seasons after construction and authorize the remaining half after assuring performance standards have been met.[311] ***Credit Ratios:*** The following acreage replacement ratios are required when purchasing credits from a mitigation bank: (a) Emergent nontidal wetlands - 1.5:1 (b) Scrub-shrub nontidal wetlands - 3:1 (c) Forested nontidal wetlands - 3:1 (d) Emergent nontidal wetlands designated as nontidal wetlands of special State concern - 3:1 (e) Scrub-shrub nontidal wetlands designated as nontidal wetlands of special State concern - 4.5:1 (f) Forested nontidal wetlands designated as nontidal wetlands of special State concern - 4.5:1[312] ***Financial assurances*:** Mitigation banks that are not federal, state, or local agencies must "post a performance bond, or alternate form of security, payable to the Department; guarantee to pay to the Department, or place in escrow or trust, an amount equal to the amount due under the mitigation fee structure for the county in which the mitigation bank is located or under guidelines in Regulation .07 of this chapter; perform the mitigation on another site acceptable to the Department; or provide such other alternate form of security as may be acceptable to the Department."[313] ***Credit verification:*** Specified in Mitigation Banking Agreements ***Performance Standards:*** Contained in Mitigation Banking Agreements ***Maintenance and Management:*** Regulations outline specific plant survival requirements that must be met by a bank. The mitigation bank concept plan also must include provisions to protect the site into perpetuity. Banking agreements also should include bank operation and maintenance procedures. ***Monitoring Protocols:*** Non-tidal bank operators must submit regular monitoring reports for the first five years of the bank. Monitoring requirements must be in the Mitigation Banking Agreement.
Buyers and sellers	***Buyers:*** 404 permittees, Department of Transportation, utilities?, land developers ***Sellers:*** Private and public banks
Geographic extent	Set out in Mitigation Banking Agreement

[311] MD. CODE REGS. § 26.23.04.04C.
[312] MD. CODE REGS. §26.23.04.03C.
[313] MD. CODE REGS. § 26.23.04.06D.

	Flow of capital	Regulated entity to bank
	Mitigation Guidance	Prioritizing Areas for Wetland Restoration, Preservation, and Mitigation[314]
	Existing/ Proposed Banks	ELI's 2005 Status Report on Compensatory Mitigation in the United States notes that there have been two banks; however, one is inactive and one has sold out of credits (s*ee* attached Wetland Mitigation Banks in the Chesapeake Bay States).
In-lieu Fee	**Summary**	Monetary compensation will be accepted by the MDE if mitigation for impacts to non-tidal wetlands is not feasible. Funds are placed into the Non-tidal Wetland Compensation Fund. Funds may only be used by the MDE for creation, restoration, and enhancement of non-tidal wetlands.[315] MDE regulations also provide for payment into a Wetlands Compensation Fund when creation, restoration, or enhancement are not feasible forms of mitigation for impacts to tidal wetlands (*see* attached In-Lieu Fee Programs in the Chesapeake Bay States).
	Geographic Extent	Not identified in regulations.

[314] Maryland Department of the Environment, *Prioritizing Areas for Wetland Restoration, Preservation, and Mitigation, at* http://www.mde.state.md.us/Programs/WaterPrograms/Wetlands_Waterways/about_wetlands/prioritizingareas.asp.

[315] MD. CODE. REGS. § 26.23.04.07.

DELAWARE

Wetlands Banking	**Summary**	Delaware's Pollution Control Regulations relating to § 401 certifications authorize use of compensation banks for mitigation impacts to waters. These regulations contain no specific requirements for banks only for wetland mitigation. Although, they do note that mitigation activities for a bank must be completed prior to activity that requires the compensation.	
	Regulatory Drivers	Wetlands Act	DEL. CODE ANN. tit. 7 § 6601 to 6620
		Subaqueous Lands Act	DEL. CODE ANN. tit. 7 § 7201 to 7217
		Wetlands regulations	7 DEL. ADMIN. CODE §§ 7502 et seq.
		Regulations Governing the Use of Subaqueous Lands	7 DEL. ADMIN. CODE §§ 7500
		Regulations Governing the Control of Water Pollution	Regulations Governing the Control of Water Pollution, available at http://www.dnrec.state.de.us/water2000/Sections/SurfWater/Library/RGCWP.pdf
	Existing/ Proposed Banks	No banks currently exist in the state (s*ee* attached Wetland Mitigation Banks in the Chesapeake Bay States).	
In-lieu Fee	**Summary**	Delaware's wetland-related laws and regulations do not include provisions relating to in-lieu fee programs. ELI's 2005 report on compensatory mitigation notes that there was one pending in-lieu fee program in the state when it was published (*see* attached In-Lieu Fee Programs in the Chesapeake Bay States).	

PENNSYLVANIA

Wetlands Banking	**Summary**	The state has no specific laws or regulations regarding wetland mitigation banking, however, it does authorize use of banks. Additionally, all the banks in Pennsylvania are owned and used by the Pennsylvania Department of Transportation.	
	Regulatory Drivers	Dam Safety and Encroachments Act	32 PA. CONS. STAT. §§ 693.1–693.27
		Dam Safety and Encroachment regulations (Water Obstruction and Encroachment Permits)	25 PA. CODE § 105.20
		Clean Streams Law	
	Mitigation Guidance	Design Criteria for Wetlands Replacement[316]	
	Existing/ Proposed Banks	A 2005 ELI Report on mitigation banking states that Pennsylvania has 3 umbrella banking agreements (s*ee* attached Wetland Mitigation Banks in the Chesapeake Bay States). A new bank was created in 2006 - the Jacob's Creek Wetlands Bank. This bank is not for a specific PADOT project, but credits will be deducted in the future when needed. The Bank is on six acres.[317]	
In-Lieu Fee	**Summary**	PADEP established the Pennsylvania Wetland Replacement Project (PWRP) in 1996. Through the PWRP, permit applicants who are impacting one-half acre of wetland or less and have no on-site wetland replacement options or alternative mitigation opportunities may contribute money into a PADEP-managed in-lieu-fee fund. Monies from the fund are then used to support the restoration of wetlands on private lands within the watershed.[318] Individual landowners, watershed associations, conservation organizations, sportsmen organizations, or other groups may propose potential projects for the PWRP.[319] PADEP staff conduct on-site assessments in cooperation with landowners, provide project design assistance and construction oversight, and conduct annual site visits to quantitatively monitor project success. Since 1996, approximately 530 contributions from applicants contributing approximately $1.4 million to the PWRP, offsetting approximately 93 acres of impacted wetland. In addition, approximately 570 individually authorized permit actions, involving less than 0.05 acres of wetland each, have resulted in a cumulative total of 15.8 acres of wetland impact statewide. These "de-minimus" impacts are also replaced by PADEP through the PWRP. During the life of the PWRP, PADEP has assisted, funded, or participated in the restoration of roughly 128 acres of wetland.[320] The 2005 ELI Report on compensatory mitigation includes this program (*see* attached In-Lieu Fee	

[316] Pennsylvania Department of Environmental Protection, *Design Criteria for Wetlands Replacement, available at* http://www.dep.state.pa.us/dep/deputate/watermgt/wc/subjects/wwec/general/wetlands/wetlands.htm (click on title at bottom of page).

[317] The Katoomba Group's Ecosystem Service Marketplace, *Jacobs Creek Puts Wetlands in the Bank (May 20, 2007), at* http://www6.lexisnexis.com/publisher/EndUser?Action=UserDisplayFullDocument&orgId=1925&topicId=100002026&docId=l:615227464&start=7.

[318] Personal Communication with Ken Reisinger (Oct. 7, 2004).

[319] PA DEP, *Public Notice – Pennsylvania Wetland Replacement Project (18 Jan 1996)*, *available at* http://www.dep.state.pa.us/dep/deputate/watermgt/Wc/Subjects/WWEC/general/wetlands/replfd1.htm.

[320] Personal communication with Kenneth Murin, Pennsylvania Department of Environmental Protection. (Apr. 3, 2004).

Programs in the Chesapeake Bay States).

Regulatory Drivers	Dam Safety and Encroachments Act	32 PA. CONS. STAT. §§ 693.1–693.27
	Dam Safety and Encroachment regulations (Water Obstruction and Encroachment Permits)	25 PA. CODE § 105.20
	Clean Streams Law	
Geographic Extent	Not identified.	

NEW YORK

Wetlands Banks	**Summary**	The state has no regulations or policies outlining mitigation banking requirements. A 2003 memo from the New York Department of Environmental Conservation does encourage use of banks; however, there is little demand for private wetland mitigation banks in the state. Most existing banks in New York are owned and used by public agencies (New York Department of Transportation and the Department of the Army).	
	Regulatory Drivers	Freshwater Wetlands Act	N.Y. ENVTL. CONSERV. LAW NY tit. 8 §§ 24-0801 to 24-0805; tit. 5 §§ 24-0501 to 24-0511
		Tidal Wetlands Act	N.Y. ENVTL. CONSERV. LAW §§ 25-0101 to 25-0405
		Wetlands adjacent to any of the state's navigable waters	N.Y. ENVTL. CONSERV. LAW tit. 5 §§ 15-0501 to 15-0516
	Mitigation Guidance	Freshwater Wetlands Regulation - Guidelines on Compensatory Mitigation[321]	
	Existing/ Proposed Banks	The 2005 ELI Report on compensatory mitigation includes two active private banks (s*ee* attached Wetland Mitigation Banks in the Chesapeake Bay States).	
In-lieu Fee	**Summary**	New York has no in-lieu fee programs.	

WASHINGTON, D.C.

Wetlands Banking	**Summary**	Washington, D.C. statutes do not include provisions relating to wetland mitigation banking.	
	Regulatory Drivers	Water Pollution Control Laws	D.C. CODE ANN.. §§ 8-103.01 to 8-103.20
	Existing/ Proposed Banks	No wetland mitigation banks exist in the District.	
In-lieu Fee	**Summary**	Washington, D.C. has the District of Columbia Stream and Wetland Mitigation Trust Fund, which is administered by the Mayor. Payments may be made into the fund to compensate for impacts or destruction of wetlands from discharge of dredge and fill material. The fund may be used for creation, restoration, and enhancement of wetlands.	
	Regulatory Drivers	Water Pollution Control Laws	D.C. CODE ANN. §§ 8-103.01 to 8-103.20

[321] New York Department of Environmental Conservation, *Freshwater Wetlands Regulation - Guidelines on Compensatory Mitigation*, *at* http://www.dec.ny.gov/docs/wildlife_pdf/wetlmit.pdf.

Table of Wetland Mitigation Banks in the Chesapeake Bay States[322]

State	Bank Name	Corps District	Year Est.	Status	Bank Sponsor	Bank Type	Credit Type(s)
DE	Glenville Mitigation Bank	Philadelphia		Pending	Delaware DOT		
DE	Poplar Hill Mitigation Bank	Philadelphia		Pending	Delaware DOT		
MD	Bryantown Mitigation Site	Baltimore	2002	Approved-Soldout	P.A. Schaumberg, Environmental Planner, LLC	Private Commercial	Wetland
MD	Middle Patuxent River Revitalization Project	Baltimore	1996	Approved-Inactive-Other Reason	OPUS East LLC	Private Commercial	
NY	D.G. Marfurt Wetland Mitigation Bank	Buffalo		Pending	D.G. Marfurt	Private Commercial	Wetland
NY	Grand River Lowlands and Cherry Valley Mitigation Sites	Buffalo	1999	Approved-active	Wetlands Preservation, Ltd.	Private Commercial	Wetland
NY	Rochester's Cornerstone Group-Rochester International Commerce Center Wetland Mitigation Bank	Buffalo	1998	Approved-active	Rochester's Cornerstone Group-Rochester International Commerce Center LLC	Private Commercial	Wetland
NY	Tonawanda Creek Mitigation Bank	Buffalo		Pending			
NY	Fort Drum Mitigation Bank	New York	2003	Approved-active	US Army at Fort Drum	Single-client	Wetland
VA	Appomattox Mitigation Bank	Norfolk	2004	Approved-active	Mike Kelly	Private Commercial	Both Wetland and Stream

[322] Table can be found in: Environmental Law Institute, *2005 Status Report on Compensatory Mitigation in the United Statse," available at* https://www.elistore.org/reports_detailasp?ID=11137 (March 2006). Mitigation banks are "grouped by state and further sorted by Corps district. The year the bank was formally established (received official signatures) is indicated. Each bank is categorized as single-client, public commercial, private commercial, combination public-private commercial, or public. The type of credits sold by each bank is noted and may include various combinations of wetland credits, stream credits, and other types of credits, including Endangered Species Act Conservation Credits, which are available or proposed at 11 banks in California. Blank fields indicate that information was not available or was not provided by the Corps districts at the time of data collection. Information was collected from August to October 2005 and verified from December 2005 to February 2006."

State	Bank Name	Corps District	Year Est.	Status	Bank Sponsor	Bank Type	Credit Type(s)
VA	Bannister Bend Mitigation Bank	Norfolk	2004	Approved-active	Mel Thomas	Private Commercial	Both Wetland and Stream
VA	Blackjack Wetland Mitigation Bank	Norfolk	2003	Approved-active	Blackjack LLC	Private Commercial	Wetland
VA	Bull Run Wetlands Bank	Norfolk	2002	Approved-active	Wetland Studies and Solutions	Private Commercial	Wetland
VA	Burnley Farms Wetland Mitigation Bank	Norfolk	2004	Approved-active	Burnley Farms	Private Commercial	Wetland
VA	Byrd Creek Wetland Mitigation Bank	Norfolk	2003	Approved-active	Joe Liesfield	Private Commercial	Wetland
VA	Cedar Run Wetlands Bank	Norfolk	2000	Approved-active	Cedar Run Wetlands, LC	Private Commercial	Wetland
VA	Chesapeake Land Development Tidal Mitigaiton Bank	Norfolk	2004	Approved-active	Chesapeake Land Development, LLC	Private Commercial	Wetland
VA	Chickahominy Environmental Bank	Norfolk	2000	Approved-active	Gray Cole, LLC	Private Commercial	Wetland
VA	City of Portsmouth Virginia Wetland Bank	Norfolk		Pending			Wetland
VA	Coverly Mitigation Bank	Norfolk	2004	Approved-active	Draper Aden	Private Commercial	Wetland
VA	Cypress Springs Mitigation Bank	Norfolk	2004	Approved-active	John McQueen	Private Commercial	Both Wetland and Stream
VA	Dundee Mitigation Bank	Norfolk		Pending		Private Commercial	
VA	Foggy Bottom Wetland Farm	Norfolk	2004	Approved-active	Foggy Bottom, LLC	Private Commercial	Wetland
VA	Great Oaks	Norfolk	2004	Approved-active	VA DOT	Single-client	Wetland
VA	Halifax Farm Environmental Bank	Norfolk	2004	Approved-active	Easrth Source Solutions	Private Commercial	Wetland
VA	Hampton Roads Wetland (Compaz) Mitigation Bank	Norfolk		Pending	Malcolm Pirnie, Inc.	Private Commercial	Wetland

State	Bank Name	Corps District	Year Est.	Status	Bank Sponsor	Bank Type	Credit Type(s)
VA	HHHunt Mitigation Bank	Norfolk		Pending	HH Hunt	Single-client	Wetland
VA	Highland Springs Mitigation Bank	Norfolk		Pending			Wetland
VA	James River Mitigation Landbank	Norfolk	1998	Approved-active	James River Wetland Mitigation Landbank LLC	Private Commercial	Both Wetland and Stream
VA	King William Mitigation Bank	Norfolk		Pending	WEG	Private Commercial	Both Wetland and Stream
VA	Liesfield Wetland Mitigation Bank	Norfolk		Pending			Wetland
VA	Massaponax Mitigation Bank	Norfolk		Pending	Crossways LLC	Private Commercial	Both Wetland and Stream
VA	Mattaponi Wetland Bank	Norfolk	2001	Approved-active	VA Dept. of Transportation	Single-client	Wetland
VA	Mountain Run	Norfolk	2002	Approved-active	VA DOT	Single-client	Both Wetland and Stream
VA	Neabsco Wetland Bank (Julie J. Metz)	Norfolk	1994	Approved-Soldout	Wetlands Studies and Solutions, Inc.	Private Commercial	Wetland
VA	New Kent Environmental Bank	Norfolk		Approved-active	Luck Sand and Gravel. LLC	Private Commercial	Both Wetland and Stream
VA	New Kent Wetland Mitigation Bank	Norfolk	2003	Approved-active	Jon Mathiasen	Private Commercial	Wetland
VA	North Fork Wetland Bank	Norfolk	1999	Approved-active	North Forks Wetlands Bank, LC	Private Commercial	Wetland
VA	North Landing River Mitigation Bank	Norfolk		Pending		Private Commercial	Wetland
VA	Northern Virginia Stream Restoration Bank	Norfolk		Pending	Wetland Studies and Solutions	Private Commercial	Stream
VA	ODEC - Virginia Power Wetland Mitigation Bank	Norfolk	1997	Approved-active	Old Dominion Electric Cooperative	Private Commercial	Wetland
VA	Pristine Wetland Mitigation Bank	Norfolk		Pending		Private Commercial	Wetland
VA	Rappahannock Mitigation Bank	Norfolk	2005	Approved-active	The CWI Group	Private Commercial	Both Wetland and Stream

State	Bank Name	Corps District	Year Est.	Status	Bank Sponsor	Bank Type	Credit Type(s)
VA	Richmond International Airport Wetland Mitigation Bank	Norfolk		Pending	Capital Region Airport Commission		Wetland
VA	Ritchie Road Mitigation Bank	Norfolk		Pending	Marsh Resources	Private Commercial	Wetland
VA	Shenandoah Wetland Bank	Norfolk	2001	Approved-active	POC - Williamsburg Environmental	Private Commercial	Both Wetland and Stream
VA	Upper Rappahannock Mitigation Bank	Norfolk		Pending	Environmental Banc & Exchange, LLC	Private Commercial	Both Wetland and Stream
VA	Virginia Department of Transportation Goose Creek Bank	Norfolk	1982	Approved-active	VA DOT	Single-client	Wetland
VA	Virginia Habitats II	Norfolk	2002	Approved-active	Earth Source Solutions	Private Commercial	Both Wetland and Stream
VA	White Cedar Mitigation Bank	Norfolk	1995	Approved-Soldout	White Cedar, LLC	Private Commercial	Wetland
VA	William Benjamin Nottoway River Wetland Bank	Norfolk		Approved-active	VA DOT	Single-client	Wetland
VA	Willis River	Norfolk	2004	Approved-active	Mel Thomas	Private Commercial	Both Wetland and Stream
VA	Woodland Mitigation Bank	Norfolk		Pending		Private Commercial	Wetland
VA	Woods at Warrenton	Norfolk		Pending	Angler Environmental	Private Commercial	Both Wetland and Stream
VA	Wreck Island Stream Bank	Norfolk	2005	Approved-active	Virginia Habitats LLC	Private Commercial	Stream
VA	York River Mitigation Bank	Norfolk		Approved-active		Private Commercial	Wetland
WV	West Virginia Wetland Bank	Huntington		Pending			
PA	None						
DC	None						

Table of In-Lieu Fee Programs in the Chesapeake Bay States[323]

State	Program Name	Corps District	Status	Program Sponsor	Program Type	Credit Type(s)
DE	The Nature Conservancy -- Delaware Region	Philadelphia	Pending	The Nature Conservancy	Corps	
MD	Maryland Department of Environment Program	Baltimore	Approved-Active	Maryland Dept. of Environment	State	Wetland
PA	Pennsylvania Wetland Replacement Project	Baltimore, Philadelphia, Pittsburgh	Approved-Active	PA Dept. of Environmental Protection, National Fish and Wildlife Foundation	State	Wetland
VA	Elizabeth River Restoration Trust Fund	Norfolk	Approved-Active	Elizabeth River Program	Corps	Wetland, Stream and Other
VA	Virginia Aquatic Resources Trust Fund	Norfolk	Approved-Active	The Nature Conservancy	Corps	Wetland, Stream and Other
WV	West Virginia In-Lieu Fee Program	Huntington, Pittsburgh	Pending	West Virginia Dept. of Environmental Protection	Corps	Both Wetland and Stream

[323] Table can be found in: Environmental Law Institute*, 2005 Status Report on Compensatory Mitigation in the United Statse," available at* https://www.elistore.org/reports_detailasp?ID=11137 (March 2006). The in-lieu-fee mitigation programs are "grouped by state and further sorted by Corps district. Each program is categorized as being authorized by the Corps, by a state-level entity or by a local government entity. The type of credits sold by each bank is noted and may include various combinations of wetland credits, stream credits, and other types of credits. Blank fields indicate that information was not available or was not provided by the Corps districts at the time of data collection. Information was collected from August to October 2005 and verified from December 2005 to February 2006."

State	Program Name	Corps District	Status	Program Sponsor	Program Type	Credit Type(s)
NY	None					
DC	None					

Table of Umbrella Banking Agreements in Chesapeake Bay States[324]

State	Umbrella Agreement Name	Corps District	Year Est.	Status	Agreement Sponsor	Agreement Type	Credit Type(s)	# Sites	# Acres	# Linear Feet
MD	Prince George's County Wetland Banking System	Baltimore	1994	Approved-Inactive	Prince George's County Government and the Maryland-National Capitol Park and Planning Commission	Single-Client	Wetland			

[324] Table can be found in: Environmental Law Institute, *2005 Status Report on Compensatory Mitigation in the United Statse," available at* https://www.elistore.org/reports_detailasp?ID=11137 (March 2006). The umbrella banking agreement are "grouped by state and further sorted by Corps district. The year the umbrella agreement was formally established (received official signatures) is indicated. The agreement sponsor is the entity responsible for credit production. Each umbrella agreement is categorized as single-client, public commercial, private commercial, combination public-private commercial, or public. The type of credits sold by each bank is noted and may include wetland credits, stream credits, or both credit types. The number of sites is the total number of bank sites approved for mitigation under the agreement, the number of acres is the total number of acres approved for wetland mitigation and the number of linear feet is the number of linear feet approved for stream mitigation. Blank fields indicate that information was not available or was not provided by the Corps districts at the time of data collection. Information was collected from August to October 2005 and verified from December 2005 to February 2006."

State	Umbrella Agreement Name	Corps District	Year Est.	Status	Agreement Sponsor	Agreement Type	Credit Type(s)	# Sites	# Acres	# Linear Feet
NC, VA	Great Dismal Swamp Restoration Bank Umbrella MOA	Wilmington, Norfolk	1997	Approved-active	Great Dismal Swamp Restoration Bank, LLC	Private Commercial	Wetland	1 in NC, 3 in VA	4000 in NC, 2750 in VA	
PA	Interagency Agreement Advance Wetland Compensation PennDOT District 3-0	Baltimore	1997	Approved-active	Pennsylvania Department of Transportation, Engineering District 3-0	Single-Client	Wetland	2	32	
PA	Interagency Agreement Advance Wetland Compensation PennDOT District 9-0	Baltimore	1995	Approved-active	Pennsylvania Department of Transportation, Engineering District 9-0	Single-Client	Wetland	5	52	
PA	Interagency Agreement Advance Wetland Compensation PennDOT District 2-0	Baltimore, Pittsburgh	2000	Approved-active	Pennsylvania Department of Transportation, Engineering District 2-0	Single-Client	Wetland	3	70.24	

State	Umbrella Agreement Name	Corps District	Year Est.	Status	Agreement Sponsor	Agreement Type	Credit Type(s)	# Sites	# Acres	# Linear Feet
PA	Interagency Agreement Advance Wetland Compensation PennDOT District 12-0	Pittsburgh	2001	Approved-active	Pennsylvania Department of Transportation, Engineering District 12-0	Single-Client	Wetland	0	0	0
VA	Clinch Powell Mitigation Bank	Norfolk		Pending			Wetland and Stream			
VA	Davis Wetland Bank	Norfolk	1998	Approved-active	Davis Wetland Bank, LLC	Private Commercial	Wetland	1	453	
VA	Hampton Roads Airport Mitigation Bank	Norfolk	2000	Approved-active	Hampton Roads Airport Mitigation Bank, LLC	Private Commercial	Wetland	1	624	
VA	James River Wetland Mitigation Bank Memorandum of Agreement	Norfolk	1999	Approved-active	James River Mitigation Technologies, LLC	Private Commercial	Wetland	2	70.4	

State	Umbrella Agreement Name	Corps District	Year Est.	Status	Agreement Sponsor	Agreement Type	Credit Type(s)	# Sites	# Acres	# Linear Feet
VA	Lower James River Wetland Mitigation Bank	Norfolk	2001	Approved-active	James River, LLC	Private Commercial	Wetland	2	120	
VA	Potomac River Mitigation Bank	Norfolk	2004	Approved-active	Marsh Resources	Private Commercial	Wetland	1	65	
VA	SWB Environmental Restoration Bank	Norfolk	2003	Approved-Inactive	SWB LLC	Private Commercial	Wetland	1	9.07	
VA	Virginia Beach Wetland Mitigation Banking System Memorandum of Agreement	Norfolk	1994	Approved-active	City of Virginia Beach, VA	Private Commercial	Wetland	1	70.3	
DE	None									
NY	None									
WV	None									
DC	None									

FORESTRY LAND MITIGATION REGULATORY BASELINE

Federal Regulatory Baseline

The federal government offers a number of cost-share and technical assistance programs to private forest landowners. Some of the federal programs are uniform across the states, while other programs give state forestry departments considerable discretion over how the programs are administered.

FOREST STEWARDSHIP PROGRAM[325]

The Forest Stewardship Program (FSP), funded by the USDA Forest Service, provides technical assistance to non-industrial private forest landowners voluntarily seeking to enhance wildlife habitat, establish windbreaks, enhance recreational opportunities, protect soil and water quality, increase wood production, and fulfill other multiple use objectives. The U.S. Forest Service enters into cooperative agreements with State Foresters to administer the program at the state level and reach individual landowners. All participants of the FSP are required to develop a Forest Stewardship Plan that will help manage private forests for timber, wildlife habitat, watershed protection, recreational opportunities and other benefits. FSP is not a cost-share program. Rather, it provides technical and planning guidance, encouraging multi-resource management. Financial assistance to implement Forest Stewardship Plans may be available through the Forest Land Enhancement Program (FLEP).[326]

FOREST LAND ENHANCEMENT PROGRAM

The FLEP[327] was authorized as a part of the 2002 Farm Bill[328] and replaces the Stewardship Incentives Program and the Forestry Incentives Program. The program is optional for states and was designed to provide educational, technical, and cost-share assistance to non-industrial private forest (NIPF) landowners to ensure sustainable management of the forests.[329] As a part of this program, states are required to develop a State Priority Plan in cooperation with their State Forest Stewardship Coordinating Committee.[330] This plan outlines provisions for the program, including "minimum acres, maximum acres, aggregate payment, use for technical, educational and cost-share

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[325] The text in this section "Forest Stewardship Program" isan updated version of the text originally published in: Environmental Law Institute, *Forests for the Bay*, *available at* https://www.elistore.org/reports_detailasp?ID=531 (2000).

326. [U.S. Department of Agriculture – Forest Service, *Forest Stewardship Program, at* http://www.fs.fed.us/spf/coop/programs/loa/fsp.shtml [last modified Feb. 6, 2007]; U.S. Department of Agriculture – Forest Service, *Forest Stewardship Program National Standards and Guidelines (Sept. 2005), available at* http://www.fs.fed.us/spf/coop/library/fsp_standards&guidelines.pdf.

[327] 36 C.F.R. 230.30 to 230.46.

[328] 16 U.S.C. 2102.

[329] 36 C.F.R. 230.30(a).

[330] 36 C.F.R. 230.34(a).

assistance, and all other factors for the program."[331] All forest landowners must have a forest management plan to be eligible to receive cost-share funding, and may receive funds for treatment of only 1,000 acres unless more acres are approved by the State Forester.[332] Various practices are eligible for funding, including management plan development, afforestation and reforestation, water quality and watershed protection, and fish and wildlife habitat improvement.[333]

All Chesapeake Bay states implement the FLEP program through their state forestry agencies.

CONSERVATION RESERVE PROGRAM

The Conservation Reserve Program (CRP) is a cost-share program administered by the USDA Farm Services Agency with technical and planning assistance from the Natural Resources Conservation Service. This program provides cost-share dollars and technical assistance to farmers and ranchers to convert highly erodible crop land to a less intensive use, which can include planting trees or constructing a riparian buffer.[334]

State Regulatory Baseline

VIRGINIA[335]

Virginia has no statewide tree preservation law or reforestation requirement related to land development activities, except buffer requirements in the areas covered by the Chesapeake Bay Preservation Act. Virginia also has no forestry practices act or licensing requirement. However, the Virginia Department of Forestry has developed voluntary Best Management Practices (BMPs) for loggers and conducts BMP compliance audits twice a year.[336]

Virginia also has a seed tree law that applies to commercial harvests on 10 or more acres with 25 percent of white or loblolly pines, and requires that at least 8 seed trees are left on the land per acre for 3 years after harvest.[337] This law does not apply if there are 400 or more of these pines that are over 4 years old. Various practices are exempt such as clearing land for pasture or agricultural purposes.[338]

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[331] U.S. Department of Agriculture – Forest Service, *Forestland Enhancement Program, at* http://www.fs.fed.us/spf/coop/programs/loa/flep.shtml [last modified Apr. 11, 2005].
[332] 36 C.F.R. 230.41(b), (c).
[333] 36 C.F.R. 230.40 (a).
[334] U.S. Department of Agriculture – Natural Resources Conservation Service, *Conservation Reserve Program, at* http://www.nrcs.usda.gov/programs/crp/ [last accessed Jul. 10, 2007].
[335] The text in this section "Virginia" isan updated version of the text originally published in: Environmental Law Institute, *Forests for the Bay*, *available at* https://www.elistore.org/reports_detailasp?ID=531 (2000).
[336] Virginia Department of Forestry, *Monitoring Water Quality*, *at* http://www.dof.virginia.gov/wq/monitoring.shtml [last modified Jul. 5, 2007].
[337] VA. CODE ANN. § 10.1-1156 to -1169.
[338] VA. CODE ANN § 10.1-1163.

Virginia also limits the ability of local governments to adopt ordinances that affect forestry practices that take place in forests districts, that are dedicated for forest use, and that are conducted in accordance with best management practices. Local governments also may not require permits or a fee for forestry activities. [339] Local governments may adopt ordinances to preserve and govern removal of "heritage, specimen, memorial, and street trees."[340]

Virginia also administers various federal and state conservation incentive programs such as the federal CRP and the state Reforestation of Timberlands Program.[341]

Market-related Laws and Regulations (i.e., potential drivers)

Tax Credits[342]

Virginia has several laws that allow county and city governments to offer property tax breaks for forested land, none of which require a forest management plan.[343] One law, the Virginia's Land Conservation Incentives Act, is an incentive program that provides income tax relief, rather than property tax relief, for donations of land or interests in land.[344] The program offers an income tax credit for a conveyance of forestland or an interest in forestland in perpetuity for natural resource, watershed, biodiversity conservation, or historic preservation purposes.[345] For lands conveyed to a public or private conservation agency for conservation or preservation purposes between January 1, 2000 and December 31, 2006, the income tax credit is equal to 50 percent of the fair market value of any land, or interest in land.[346] However, for conveyances made on or after January 1, 2007, the income tax credit is equal to 40 percent of the fair market value of any land or interest in land.[347] The amount of the credit that may be claimed is up to $100,000.[348] In 2002, the Virginia legislature expanded this act to authorize any taxpayer who receives an income tax credit under the act to transfer unused credit to another taxpayer for use on another Virginia income tax return.[349]

Virginia also has adopted the Riparian Buffer Tax Credit program for those who own forested land and leave buffer areas along streams and rivers when harvesting timber.

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[339] VA. CODE ANN § 10.1-1126.1(B).
[340] VA. CODE ANN § 10.1. – 1127.1.
[341] *See* Virginia Department of Forestry, *Cost Share Programs*, *at* http://www.dof.virginia.gov/mgt/cip-summary.shtml [last modified Jan. 17, 2007].
[342] The text in this section "Tax Credits" is an updated version of the text originally published in: Environmental Law Institute, *Protecting Delaware's Natural heritage: Tools for Biodiversity Conservationr* , *available at* https://www.elistore.org/reports_detailasp?ID=499 (1999).
[343] VA. CODE ANN. 58.1-3229 et seq; 15.2-4300 et seq; 15.2-4400.
[344] VA. CODE ANN. §§ 58.1-510 through -513.
[345] *Id.* § 58.1-512.
[346] *Id.*
[347] *Id.*
[348] *Id.*
[349] *Id.* § 58.1-513.

The credit equals 25 percent of the timber that is not harvested in the buffer zone up to $17,500.[350]

[350] Virginia Department of Forestry, *Riparian Buffer Tax Credit,* http://www.dof.virginia.gov/rfb/rbtc-index.shtml [last updated Nov. 21, 2006].

Water Quality
Virginia's laws regarding silviculture require that an owner or operator who is carrying out activities that has or may result in pollution to stop their activities. A State Forester may recommend corrective or mitigation actions that need to be taken.[351]

Point of contact
Matt Piorot, Water Quality Program Manager, Virginia Department of Forestry
434-977-6555

MARYLAND

Maryland has various forestry-related laws and regulations pertaining to forest mitigation and forest practices. The state also administers both federal and state forest conservation incentive programs such as the federal FLEP and the State's Woodland Incentive Program.[352]

***Forest Conservation Act*[353]**

The Forest Conservation Act[354] requires each unit of local government having planning and zoning authority to develop a forest conservation program with elements consistent with state law. The law applies throughout the state except in counties that have and maintain 200,000 acres or more in forest cover (Allegany and Garrett Counties in western Maryland). [355] The Maryland Department of Natural Resources administers the law if a county or local government does not adopt a forest conservation ordinance.[356]

The Forest Conservation Act applies "to any public or private subdivision plan or application for a grading or sediment control permit on areas 40,000 square feet or greater." The Prince George's County ordinance makes the program applicable to disturbances of 15,000 square feet or greater in that county. The Act does not apply to construction of highways (which have their own mitigation requirements), to forest cutting in areas governed by the Chesapeake Bay Critical Area Protection Law (which has its own protective provisions), or to agricultural activity that does not result in a change in land use. Nor does it apply to commercial timber harvesting, so long as the property in question is not the subject of a grading permit for development within five years after the harvest.[357]

Forest Conservation Plan

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[351] VA. CODE ANN § 10.1-1181.2.
[352] *See* Maryland Forest Service, *Forest Stewardship*, *at*
http://www.dnr.state.md.us/forests/programapps/stewcon.asp [last accessed Jul. 10, 2007]
[353] The text in this section "Forest Conservation Act" is an updated version of the text originally published in: Environmental Law Institute, *Forests for the Bay*, *available at*
https://www.elistore.org/reports_detailasp?ID=531 (2000).
[354] MD. CODE ANN., NAT. RES. § 5-1601 to 5-1613.
[355] MD. CODE ANN., NAT. RES. § 5-1602.
[356] MD. CODE ANN., NAT. RES. § 5-1603.
[357] MD. CODE ANN., NAT. RES. § 5-1602.

The law provides that "[b]efore the approval of the final subdivision plan, or the issuance of the grading or sediment control permit by the State or local authority," the developer must conduct a forest stand delineation, which is reviewed by the county, and then must submit an acceptable forest conservation plan.[358] The plan must provide for forest retention and reforestation, and in certain cases for afforestation of previously non-forested areas. The law establishes priority criteria for where forests should be retained on development tracts. These include sensitive areas, areas of contiguous forests that provide connectivity with other tracts, larger trees, and those that are rare, threatened or endangered or associated with historic structures. The law also establishes priorities for reforestation and afforestation areas. These include riparian buffers, forest corridors, floodplains, and contiguous forests.[359]

Forested or reforested land covered by the forest conservation plan must retained as forest and may be placed under conservation easement conveyed to the local jurisdiction, or other suitable long term protection requiring that the land remain permanently in forest.[360] Reforestation or afforestation that cannot be accomplished onsite may be conducted offsite in the same watershed or in accordance with an approved master plan.[361] Several Maryland counties also allow offsite forest mitigation banking, which is specifically authorized under the state law.[362] If required reforestation or afforestation cannot be completed on site, off site, or through a bank, the developer must pay into the applicable state (or county or local) Forest Conservation Fund amounts to be used for reforestation and afforestation in the same county or watershed…[363]

Afforestation and Reforestation
The law requires developers to plant new forest in some development areas where existing forest cover is minimal. Commercial or industrial properties and high density residential areas with less than 15 percent pre-development forest cover must *afforest* up to 15 percent. Developments in agricultural and resource areas or areas zoned for medium residential density that have less than 20 percent of the net tract area in forest cover must be afforested up to 20 percent.

Areas that are deforested by the development must be partially reforested. The reforestation requirement is linked to a "conservation threshold." The threshold is defined as 50 percent of the pre-development forest for agriculture and resource areas, 25 percent for medium density residential development, 20 percent for high density residential or institutional development, and 15 percent for commercial, industrial, mixed use, and planned unit developments. If the amount of forest removed by the development activity results in a remaining forest area that is *above* the specified conservation threshold, reforestation is required for the forest cover removed at a ratio of 1/4:1. (One quarter acre of trees must be planted for each acre cleared). The law also grants a credit against

[358] MD. CODE ANN., NAT. RES. § 5-1605,-1608(a),(b).
[359] MD. CODE ANN., NAT. RES. § 5-1607(c), (d).
[360] MD. CODE ANN., NAT. RES. § 5-1607(e).
[361] MD. CODE ANN., NAT. RES. § 5-1607(a).
[362] MD. CODE ANN., NAT. RES. § 5-1607(a), (b); 5-1610.1 et seq.
[363] MD. CODE ANN., NAT. RES. § 5-1610.

this required reforestation for each forested acre retained above the conservation threshold. In developments where the development activity results in a remaining forest cover *below* the conservation threshold, reforestation is required at 1/4:1 for the acres deforested down to the threshold, and at 2:1 for acres deforested below the threshold….[364]

Point of Contact
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County Forest Conservation Programs
Maryland counties that have planning and zoning authority are required to develop a forest conservation program with elements consistent with the State's Forest Conservation Act. Maryland counties with forest conservation programs include: Anne Arundel,[365] Calvert,[366] Montgomery,[367] Queen Anne,[368] Charles,[369] Prince George's,[370] Dorchester,[371] Baltimore,[372] Baltimore City,[373] Hardford,[374] Talbot,[375] Caroline,[376] Howard,[377] Kent,[378] Wicomico,[379] Frederick.[380] All counties also have programs for developers to put money into a forest conservation fund if reforestation on-site or off-site is not possible (see Table 1). Only five counties have regulations allowing for the establishment of forest mitigation banks (see table 2).

Table 1. Counties with Forest Conservation Funds and In-lieu Fee Programs
Anne Arundel[381]
Calvert County[382]
Montgomery County[383]
Charles County[384]

[364] MD. CODE ANN., NAT. RES. § 5-1606 et seq.
[365] Anne Arundel Code § 17-6-300 to 17-6-309.
[366] Calver County Code §§ 8-3.01 to-3.04.
[367] Montgomery County Code § 22A
[368] Queen Anne's County Code §§ 18:2-1 et seq.
[369] Charles County Code §§ 298-1 et seq.
[370] Prince George's County Code §§ 4-352; 25-117(a) to -117(d).
[371] Dorchester County Code §§ 140-56 to 68.
[372] Baltimore County Code §§ 33-6-101 to 33-6-122.
[373] Baltimore City Code ART. 7, §§ 41-1 to 48-4; *Baltimore City Supplement to the State Forest Conservation Manual*
[374] Hardford County Code §§ 267-30.1 to -30.15.
[375] Talbot County Code §§ 73-1 to 73-19.
[376] Caroline County Code §§ 109-1 to 109-42.
[377] Howard County Code §§ 16.1200 to 16.1217.
[378] Kent County Code §§ 185-1 to185 -24.
[379] Wicomico County Code §§ 126-1 to 126-33.
[380] Fredrick County Code §§ 1-21-1 to 1-21-52.
[381] Anne Arundel County Code § 17-6-308.
[382] Calvert County Code § 8-3.04(L).
[383] Montgomery County Code § 22A-12(g)
[384] Charles County Code § 298-14(B).

Prince George's[385]
Queen Anne's County[386]
Baltimore City[387]
Baltimore County[388]
Hardford County[389]
Talbot County[390]
Caroline County[391]
Howard County[392]
Kent County[393]
Wicomico[394]
Frederick[395]

Table 2. Counties with Authority to Establish Forest Mitigation Banks
Calvert County[396]
Montgomery County[397]
Queen Anne's County[398]
Howard County[399]
Frederick[400]

Chesapeake Bay Critical Areas[401]

The Chesapeake Bay Critical Areas Act[402] and regulations require all county and municipal critical areas programs to include a provision requiring all timber harvests that

[385] Prince George's County Code§ 4-352(31).
[386] Queen Anne's County Code § 18:2-15
[387] Baltimore City Code § 46-2.
[388] Baltimore County Code § 3-6-114.
[389] Hardford County Code § 267-30.9
[390] Talbot County Code §§ 73-14.
[391] Caroline County Code § 109-31.
[392] Howard County Code § 16.1210.
[393] Kent County Code § 185-16.
[394] Wicomico County Code § 126-17.
[395] Frederick County Code § 1-21-24.
[396] Calvert County Code § 8-3.04(J)(5).
[397] Montgomery County Code § 22A-13.
[398] Queen Anne's County Code § 18:2-16
[399] Howard County Code § 16.1216.
[400] Frederick County Code § 1-21-29.
[401] The text in this section "Chesapeake Bay Critical Areas" is an updated version of the text originally published in: Environmental Law Institute, *Forests for the Bay*, *available at* https://www.elistore.org/reports_detailasp?ID=531 (2000).
[402] MD. CODE ANN. Nat. Res. §§ 8-1801 to -1817. Critical areas are defined as "1) All waters of and lands under the Chesapeake Bay and its tributaries to the head of tide as indicated on the State wetlands maps, and all State and private wetlands designated under Title 16 of the Environment Article; and (2) All land and water areas within 1,000 feet beyond the landward boundaries of State or private wetlands and the heads of tides designated under Title 16 of the Environment Article." MD. CODE ANN. Nat. Res. § 8-1807(a).

occur within one year and affect more than one acre to be conducted in accordance with forest management plan prepared by registered professional forester and approved by the district forestry board.[403] In general, the law prohibits most cutting within 100 feet of water. (In the second 50 feet some selective cutting may be approved and clear-cutting of loblolly pine and yellow poplar may be permitted if a buffer management plan is prepared).[404] Regulations also "provide that the removal of trees associated with development activities shall be minimized and, where appropriate, shall be mitigated."[405]

Development activities requiring clearing of land [also] are restricted in the critical area (1000 feet from tidal waters and their tributaries and wetlands).[406] The first 100 feet (the shoreline buffer) must be maintained in natural or planted vegetation (including trees). Within Critical Areas development is allowed in some locations, such as limited development areas[407] and intensely developed areas,[408] and regulations outline specific mitigation ratios for when forests are cut or cleared.[409] Creation of impervious surfaces is limited to 15 percent in limited development areas.[410]

Market-related Laws and Regulations[411](

Reforestation Law

Maryland's Reforestation Law requires all construction projects using any state funding to do mitigation of all forest impacts of one acre or greater. Replacement is required acre-for-acre and must occur on public land. Priority areas for mitigation are in the same county and watershed as the impact. Absent a suitable mitigation site, then credits may be purchased from a forest mitigation bank. If the constructing agency cannot find a suitable amount of land for mitigation or a suitable about of credits, then funds must be contributed to the Reforestation Fund at $0.10 per square foot ($4,356 per acre).[412]

Forestry Conservancy District Law

Maryland's Forest Conservancy District Law[413] authorizes the Department of Natural Resources (DNR) to "administer forest conservation practices on privately owned forest land," to "promulgate rules and regulations," and to enforce the law.[414] The law is

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[403] MD. CODE REGS. § 27.01.05.03.
[404] MD. CODE REGS. § 27.01.09.01.
[405] MD. CODE REGS. § 27.01.05.02.
[40] MD. CODE ANN. Nat. Res. §§ 8-1801 et seq.
[407] Limited development areas are defined as "those areas which are currently developed in low or moderate intensity uses." MD. CODE REGS. § 27.01.02.04(A).
[408] Intensely developed areas are defined as "those areas where residential, commercial, institutional, and/or industrial, developed land uses predominate, and where relatively little natural habitat occurs." MD. CODE REGS. § 27.01.02.03(A).
[409] *See* MD. CODE REGS. §§ 27.01.02.04; 27.01.02.03.
[410] MD. CODE REGS. § 27.01.02.04(C).
[411] The text in this section "Market-related Laws and Regulations" is an updated version of the text originally published in: Environmental Law Institute, *Forests for the Bay*, *available at* https://www.elistore.org/reports_detailasp?ID=531 (2000).
[412] MD. CODE ANN, NAT. RES. § 5-103.
[413] MD. CODE ANN., NAT. RES. § 5-601 et seq.
[414] MD. CODE ANN., NAT. RES. §§ 5-603, 5-604.

administered primarily by the forest conservancy district boards appointed in each Maryland county and Baltimore City by the Secretary of DNR. It provides that any forest lands of three acres or greater on which commercial cutting is done must be left "in a favorable condition for regrowth," that young growth be retained as far as feasible during logging, that restocking after harvest be arranged by leaving seed trees or by other means (clearcutting may be approved by the board), and that the operator maintain adequate growing stock after selective cutting.[415] The landowner must apply for an inspection at least 30 days prior to cutting and the district board must provide for examination of the site "by a qualified person," which may include a consulting licensed forester.[416]

Tax Credit Programs
Maryland also has a program that allows forested property that is managed under a forest management plan to be assessed at a reduced value for tax purposes. It also has an income tax credit for those owning forested lands under a forested management plan to encourage reforestation and effective management.[417]

PENNSYLVANIA[418]

Like Virginia, Pennsylvania has no forest practices act, licensing requirements, or forest regeneration requirements. However, it does allow local government to adopt ordinances that regulate timber harvests, subject to a state law that prohibits local governments from "unreasonably" restricting forestry activities. Pennsylvania also has no tree preservation or reforestation requirement relating to development activities. Local governments may adopt these requirements under their general land use authorities. For example, Lancaster County's subdivision and land development ordinance provides that at least 25 percent of the number of trees at the time of subdivision plan submittal must be maintained or replaced following construction.[419]

Pennsylvania also administers various federal and state conservation incentive programs, including the federal Forest Stewardship Program and the Pennsylvania Stream ReLeaf program.[420]

Market-related Laws and Regulations

Tax Credit Program[421]

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[415] These requirements do not apply to cutting by an owner or tenant for domestic use. MD. CODE ANN., Nat. Res. § 5-608.
[416] MD. CODE ANN., NAT. RES. § 5-608.
[417] MD. CODE ANN. Tax Prop. §§ 8-211; 8-209.
[418] The text in this section "Pennsylvania" isan updated version of the text originally published in: Environmental Law Institute, *Forests for the Bay*, *available at* https://www.elistore.org/reports_detailasp?ID=531 (2000).
[419] Ordinance, § 608.2, cited in NRCS, Natural Resources Conservation Law: A Report on 17 States and Their Selected Counties and Townships (July 1999), p 239.
[420] Pennsylvania Department of Conservation and Recreation, *Rural and Community Forestry, at* http://www.dcnr.state.pa.us/forestry/rural/index.aspx [last accessed Jul. 10, 2007].

Pennsylvania also has two programs that offer reductions in property value assessments for tax purposes. Neither requires a forest management plan and both discourage future conversions of land.[422] Land in forest reserves[423] also may receive preferential assessment if it is stocked with trees and has 10 or more contiguous acres.[424]

Water Quality Requirements[425]

Pennsylvania's Clean Stream Law[426] requires that earthmoving activities, including timber harvests, be conducted with control measures in place to prevent erosion and sedimentation, including implementation and maintenance of BMPs. If earth disturbance will impact over 5,000 square feet, then an Erosion and Sediment Control plan must be developed.[427] An Erosion and Sediment Control Permit is required for all timber harvest activities that affect over 25 acres.[428]

DELAWARE

Delaware's Forestry Law guides the administration of the state's forestry programs for public and private forest land.[429] The Forestry Law provides Delaware Department of Agriculture [DDA] Forest Service with the authority to promulgate rules and regulations to protect forest lands and prevent forest fires. However, Delaware has no laws or regulations with licensing or reforestation requirements. Delaware also implements various federal cost-share and technical assistance programs for foresters, and the State has its own Forestry Cost-share Program.[430]

Market-related Laws and Regulations

Seed Tree Program[431]

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[421] The text in this section "Tax Credit Programs" is an updated version of the text originally published in: Environmental Law Institute, *Forests for the Bay*, *available at* https://www.elistore.org/reports_detailasp?ID=531 (2000).
[422] Act 319, PA. STAT. ANN. tit. 72 § 5490.1-13; PA. STAT. ANN. tit. 16 § 11941 et seq.
[423] A forest reserve is "[l]and, 10 acres or more, stocked by forest trees of any size and capable of producing timber or other wood products. The term includes farmstead land on the tract." Pa. Stat. Ann. tit. 7 § 137b.2.
[424] PA. STAT. ANN tit. 7 § 137b.14.
[425] The text in this section "Water Quality Requirements" is an updated version of the text originally published in: Environmental Law Institute, *Forests for the Bay*, *available at* https://www.elistore.org/reports_detailasp?ID=531 (2000).
[426] Act of 1937, P.L. 1987, No. 394.
[427] 25 PA. ADMIN. CODE § 102.4.
[428] 25 PA. ADMIN. CODE § 102.5.
[429] DEL. CODE ANN. tit. 3, § 1001 et seq.
[430] Delaware Department of Agriculture – Forest Service, *Forest Service – Forest Conservation, at* http://dda.delaware.gov/forestry/conser.shtml [last accessed Jul. 10, 2007].
[431] The text in this section "Tax Credits" is an updated version of the text originally published in: Environmental Law Institute, *Protecting Delaware's Natural heritage: Tools for Biodiversity Conservationr* , *available at* https://www.elistore.org/reports_detailasp?ID=499 (1999).

Delaware's Seed Tree Program[432] was enacted to encourage the regeneration of specific native, commercially valuable tree species. The program applies to all forested tracts of 10 or more acres on which loblolly pine, pond pine, shortleaf pine or yellow-poplar individually or collectively constitute 25 percent or more of the live trees on each acre. Under the program, when such lands are harvested for commercial purposes and will remain forest land following the harvest, landowners are required to employ "natural regeneration."[433] Natural regeneration consists of reserving at least six large, seed-bearing trees on each acre of forested land.[434] These trees need not be reserved if at least 400 seedlings exist on each acre following the harvest.[435] As an alternative to natural regeneration, the landowner may reforest the land in accordance with an "approved reforestation plan."[436]

While the Seed Tree Program is not aimed at protecting biodiversity, its provisions for reforestation can help maintain biologically valuable forest habitat on private lands.

Water Quality Requirements (*The text below is taken from a 1999 ELI report entitled "Protecting Delaware's Natural Heritage: Tools for Biodiversity Conservation." The information has been updated.*)
Delaware's Forestry Practices Erosion and Sedimentation Law[437] is designed to protect surface waters from the adverse effects of pollution from sediment related to silvicultural activities (harvesting of timber, construction of roads and trails for forest management, and preparation of property for reforestation).[438] If the DDA Forest Service finds that a forest owner or operator is conducting silvicultural activities that cause pollution that might alter the physical, chemical, or biological properties of state waters in such a way that would cause harm to animals, fish, or aquatic life, then the agency may provide advice on corrective measures or issue special orders following a hearing. DDA Forest Service can order the owner/operator to cease immediately activities causing pollution and order the implementation of corrective measures.[439] DDA Forest Service can also assess penalties if an owner or operator fails or refuses to follow special orders issued by the agency.[440]

Erosion and sediment control regulations require that forest land owners and timber harvest operators follow the DDA Forest Services' Forestry Best Management Practices (BMP) Manual.[441]

Tax Credit Program
Under the Commercial Forest Plantation Act, those who own forest plantations and plan to keep 10 or more contiguous acres forested (through planting and/ or natural

[432] DEL. CODE ANN. tit. 3, §§ 1051-1061.
[433] *See id.* §§ 1052, 1054.
[434] *See id.* § 1054 (a).
[435] *See id.* § 1054 (c).
[436] *See id.* § 1055.
[437] DEL. CODE ANN. tit. 3, §§ 1071-1080.
[438] *See id.* § 1072(4).
[439] *See id.* § 1074.
[440] *See id.* § 1079.
[441] Forest Service Regulations 2.0 Available at http://dda.delaware.gov/forestry/forms/ES%209-26-02.pdf.

reproduction) to produce timber and other wood products can apply for a 30 year tax credit.[442]

NEW YORK

The New York Department of Environmental Conservation (NY DEC) does not require timber harvesters to be licensed nor does it have any regulations relating to forest mitigation. The Department does provide technical assistance to private forest landowners, including wildlife habitat management, erosion control, and tree planting, pursuant to the New York Cooperative Forests Management Act. The NY DEC also has established the Cooperating Foresters Program, where cooperating private foresters that have agreed to follow established management standards assist other foresters in making their operations more sustainable.[443] The NY DEC also has developed BMPs that private landowners may adopt, and administers various federal incentive programs, such as the FLEP.

Market-related Laws and Regulations

Forest Practice Standards
To encourage forestry, New York's forestry-related laws require that nine regional forest practice boards develop and adopt "forest practice standards" for their regions. Once approved, the boards may assist cooperating land owners in implementing the standards. The boards also are responsible for approving forest management plans that are submitted by landowners in lieu of complying with the forest practice standards as long as the plans incorporate provisions and standards equivalent to what is in the forest practice standards.[444]

Wild, Scenic, and Recreational River Permit
Some forestry practices require a Wild, Scenic, and Recreational River permit. For example, for scenic rivers "[f]orest management and accessory structures (other than docks and boathouses) located on slopes of 15% or less and beyond the 100 year floodplain are not permitted less than 250 feet from the river bank. Those located more than 250 feet from the river bank are allowed and do not require a permit."[445] Additionally, if logging will change or affect the course, channel, or flow of a stream a water protection permit will be required.[446]

Tax Credit Program
New York DEC also administers a tax credit program for forest landowners. To receive a tax credit, forest landowners must have 50 or more acres of contiguous forest and all

[442] DEL. CODE ANN. tit. 3§ 2601 et seq.
[443] New York Department of Conservation, *Protect and Improve the Quality of Your Forest Land, at* http://www.dec.ny.gov/lands/5238.html [last accessed Jul. 9, 2007].
[444] N.Y. ENVTL. CONSERV. LAW tit. 7 §§ 9-0701; -0709.
[445] N.Y. ENVTL. CONSERV. LAW tit. 27; 6 .Y. COMP. CODES R. & REGS Y CRR PART 666.
[446] N.Y. ENVTL. CONSERV. LAW tit. 5 § 15-0501.

harvests conducted within three years prior to application for the credit must have been carried out in accordance with a sound management program. All lands receiving the credit must be managed under a DEC approved forest management plan.[447]

WEST VIRGINIA

West Virginia has licensing requirements for both timber harvest operations as well as operation supervisors. It does not have any development-related reforestation regulatory requirements. The state also administers various federal conservation incentive programs such as FLEP and the Forest Stewardship Program.[448]

Market-related Laws and Regulations

Water Quality Requirements
West Virginia's Logging Sediment Control Act[449] requires any one in West Virginia who has timber harvest operations to receive a license for the operation.[450] All operators in supervisory roles also must receive a certification to harvest timber. To receive certification loggers must receive education and training on best management practices to decrease soil erosion.[451] This Act also requires logging operations to implement BMPs, including practices to decrease erosion and maintain water quality.[452] If a BMP is not implemented that causes or has the potential to cause soil erosion and water quality problems, the Division of Forestry may issue a compliance order.[453] In addition, timber storage facilities are required to obtain a storm water general permit and a NPDES permit.[454]

Tax Credit Program
Under the State's Managed Timberland Program, landowners with timberland that meet the following four requirements can apply to have their lands assessed at a reduced value for tax purposes.

I. Ten contiguous wooded acres, minimum.
II. Management plan.
III. No harvesting activities until a management plan is in place.
IV. All owners must be in agreement[455]

WASHINGTON, D.C.

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[447] N.Y. REAL PROP. TAX tit. 2 § 480.
[448] *See* West Virginia Division of Forestry homepage for links to various programs: http://www.wvforestry.com/ .
[449] W. VA. CODE § 19-1B-1 to -14.
[450] W. VA. CODE § 19-1B-4
[451] W. VA. CODE § 19-1B-7.
[452] W. VA. CODE § 19-1B-6(a).
[453] W. VA. CODE § 19-1B-5(b)-(e).
[454] Appalachian Hardwood Center, West Virginia University, *Laws and Regulations for West Virginia's Loggers (2007), 10, available at* http://www.wvforestry.com/Laws_and_Regs_for_WV_Loggers.pdf.
[455] West Virginia Division of Forestry, *Managed Timberland Fact Sheet (Mar. 2002), available at* http://www.wvforestry.com/MT%20Fact%20Sheet.pdf.

Washington, D.C.'s Urban Forest Preservation regulations[456] provide for the protection of "special trees" (i.e., trees greater than 55 inches in circumference).[457] These trees may not be cut without a special permit.[458]

[456] D.C. CODE ANN. § 8-651.01 to 8-651.08.
[457] D.C. CODE ANN. § 8-651.02(5).
[458] D.C. CODE ANN. § 8-651.04.

SUMMARY TABLE OF FOREST MITIGATION BANKING

MARYLAND

Regulatory Drivers

Forest Conservation Act	MD. CODE ANN., NAT. RES. § 5-1601 to 5-1613
Reforestation Law	MD. CODE ANN, NAT. RES. § 5-103
Forestry Conservancy District Law	MD. CODE ANN., NAT. RES. § 5-601 et seq.
Tax Credit Programs	MD. CODE ANN. Tax Prop. 8-211; 8-209

Transaction Requirements

All developers that are submitting a public or private subdivision plan or application for a grading or sediment control permit on areas 40,000 square feet or greater for approval to state or local authorities for approval must first conduct a forest stand delineation and develop a forest conservation plan. If reforestation and afforestation requirements can not be met on the developed land, the developer may reforest or afforest at an off-site location. Developers must have a master plan if using mitigation bank credits.

A mitigation bank owner must have a mitigation banking agreement with the appropriate local program (county forest conservation program. Bank owners must submit an application (approved by the MDNR), bank mitigation plan (must include forest stand delineation and a reforestation/afforestation plan prepared by a Maryland licensed forester), and deed as well as other documents to establish a forest mitigation bank. Bankers must afforest and reforest in accordance with their banking agreement; protect the land by deed, easement, or covenant; restrict use of land; and use native plants; and plant trees to enhance riparian buffers, establish forest corridors, protect 100-year flood plains, or stabilize slopes.[459]

Bank Specifics

Unit of credit: Acres

Credit release: "A bank may not debit any portion of the afforested or reforested land until 2 years of successful growth have been achieved unless the banker has posted a bond or alternate form of security to ensure that trees will be cared for and maintained in perpetuity."

Financial Assurances: Must ensure have appropriate deeds for land that show it can be used as a forest mitigation bank.

Monitoring Protocols: All banks must have a tracking system in place to track all debits and credits.

Maintenance and Management: Bank mitigation plan must include

[459] MD. CODE REGS § 08.19.02.02Q

	a two-year maintenance agreement
Geographic Extent	County
Buyers and Sellers	***Buyers*:** Subdivision developers, anyone needing a sediment and grading control permit ***Sellers:*** Banks (can be private companies or non-profits)
Flow of capital	Developer or regulated entity to bank to credit generator Maryland
Existing Banks	Banks are primarily overseen at the county level. Counties are required to submit annual reports to the MDNR each year that includes established banks; however, the MDNR only has information for 9 of the 23 counties covered under the Forest Conservation Act for fiscal year 2006. The MDNR hopes to receive information from all counties for fiscal year 2007 by December so that it may develop a 15-year report.[460] In regards to forest mitigation banking, approximately $6,000 to 10,000/acre is being paid to conserve existing forest and up to $16,000/acre being paid to plant new forest.[461] In addition to county-level banks, the Maryland Land Reserve "offers property to development companies in need of forest conservation acreage."[462]

[460] Personal communication with Marian Honeczy, Maryland Department of Natural Resources (Aug. 13,. 2007).
[461] Maryland Department of Natural Resources – Forest Service, *Minutes: Maryland Forest Conservation Goal-Setting (Feb. 20, 2007), available at* http://www.dnr.state.md.us/forests/download/Meeting%20Notes2_20_07.pdf.
[462] Maryland Land Reserve, *What We Do*, *at* http://marylandlandreserve.com/whatWeDo.cfm [last accessed Aug. 13, 2007].

POTENTIAL REGULATORY DRIVERS FOR OTHER BAY STATES

Virginia	Chesapeake Bay Preservation Act	VA. CODE ANN. § 10.1-2100 et seq.
	Tax incentive-related laws	VA. CODE ANN. §§ 58.1.3229 et seq; 15.2-4300 et seq; 15.2-4400
	Riparian Buffer Tax Credit	
	Statute relating to silviculture and water quality	VA. CODE ANN § 10.1-1181.2
West Virginia	Laws and Regulations for West Virginia's Loggers	Appalachian Hardwood Center, West Virginia University, *Laws and Regulations for West Virginia's Loggers (2007), 10, available at* http://www.wvforestry.com/Laws_and_Regs_for_WV_Loggers.pdf.
	Logging Sediment Control Act	W. VA. CODE § 19-1B-1 to 19-1B-14
Pennsylvania	Tax Credit Programs	Act 319, PA. STAT. ANN. tit. 72 § 5490.1-13; PA. STAT. ANN. tit. 16 § 11941 et seq.
	Clean Stream Law	Act of 1937, P.L. 1987, No. 394; PA. STAT. ANN tit. 7 § 137b.14
Delaware	Forestry Law	DEL. CODE ANN. tit. 3, § 1001 et seq.
	Seed Tree Law	DEL. CODE ANN. tit. 3, §§ 1051-1061
	Forestry Practices Erosion and Sedimentation Law	DEL. CODE ANN. tit. 3, §§ 1071-1080
	Commercial Forest Plantation Act	DEL. CODE ANN. tit. 3§ 2601 et seq.
New York	Forest Practice Standards	N.Y. ENVTL. CONSERV. LAW tit. 7 §§ 9-0701; -0709
	Wild, Scenic, and Recreational Rivers	N.Y. ENVTL. CONSERV. LAW tit. 27; 6 N.Y. COMP. CODES R. & REGS Y CRR PART 666
	Tax Credit Program	N.Y. REAL PROP. TAX tit. 2 § 480
Washington, D.C	Urban Forest Preservation regulations	D.C. CODE ANN. § 8-651.01 to 8-651.08

Federal Pending Legislation and Regulatory Changes

Water Quality-related Legislation

Farm, Nutrition, and Bioenergy Act of 2007 (Farm Bill 2007,H.R. 2419)

§ 2301 Chesapeake Bay Program for Nutrient Reduction and Sediment Control
The Secretary of Agriculture must develop a comprehensive plan for the Chesapeake Bay Watershed. The plan must provide for restoration and protection of the Bay. Strategies should include development of "new technologies and innovative approaches" to meet the following goals:

(1) Improvement of water quality and quantity within the Chesapeake Bay;
(1) Restoration, enhancement, and preservation of habitat for plants and wildlife; and
(3) Increase economic opportunity for producers and rural communities.

The Department will have two years to submit the plan after the law is passed. To work towards meeting the above goals, the U.S. Department of Agriculture (USDA) Secretary may work with other federal and state agencies to implement restoration enhancement and preservation projects. Priorities for projects will be the Susquehanna River, the Shenandoah River, the Potomac River, and the Patuxent River. Finally, the Congress finds that because USDA programs play an important role in the Chesapeake Bay Watershed that the USDA should become a member of the Chesapeake Bay Executive Council.

§ 2407 Promotion of Market-based Approaches to Conservation
The approved House bill also aims to conduct research and analysis to develop successful market-based approaches for environmental services produced by the agricultural sector. This research would focus on:

(1) Promoting the development of consistent standards and processes for quantifying environmental benefits, including the creation of performance standards or baselines;
(2) Promoting the establishment of reporting and credit registries, including third-party verification and certification; and
(3) Promoting actions that facilitate the development and functioning of private-sector market-based approaches for environmental goods and services involving agriculture and forestry.

In addition, if enacted, this legislation would establish an Environmental Services Standards Board in an effort to design performance standards developing a credit market for conservation practices on forested and agriculture lands.

Chesapeake's Healthy and Environmentally Sound Stewardship of Energy and Agriculture Act of 2007 (H.R. 1766)

Chesapeake's Healthy and Environmentally Sound Stewardship of Energy and Agriculture Act of 2007 (CHESSEA) amends the 1985 Food Security Act to expand

funding for the USDA Environmental Quality Incentives Program and establishes interstate watersheds as priorities to receive funding for this program, specifically citing the Chesapeake Bay as an example watershed. The USDA's Conservation Reserve, Wetlands Reserve, and Conservation Security Programs are extended under this bill as well. In addition, the bill amends the 2002 Farm Security and Rural Investment Act to provide grants to Bay states for projects to convert biomass to fuel, which also would help reduce nutrient runoff. Finally, the bill authorizes a conservation planning pilot program within the Bay states.

H.R. 720

This bill would amend the Clean Water Act (CWA) in various sections. Amendments to the section on Water Pollution Abatement Revolving Loan Funds would allow states that already provide administrative assistance to municipalities or state agencies under this program to provide additional subsidies. These subsidies may take the form of debt forgiveness if municipalities are implementing innovative water quality control activities, including nutrient trading.

S. 1424

Section 2040R of this bill, entitled Pilot Program for Risk Management, recognizes that agricultural operations may not implement BMPs or other conservation measures due to the risk involved. This bill would initiate pilot programs in various areas, including the Chesapeake Bay, to "support innovative conservation risk management tools to encourage the implementation of conservation and best management practices on land in agricultural production."

Climate Change Legislation

Forest Service Carbon Credit Plan

The U.S. Forest Service and the National Forest Foundation has proposed a program to sell carbon credits to people who would like to offset the amount of greenhouse gases (GHG) they emit. The Forest Service would do this by measuring the amount of carbon in trees that are part of reforestation projects in areas that have been destroyed by forest fires or tornados. The sale of credits will fund the reforestation projects; however, there are no provisions to ensure these reforested areas are held in conservation easement or not logged in the future. In addition, no new Forest Service classification will be developed for these areas.[463]

[For information on pending climate change legislation see separate document entitled "Climate Change T3."]

Forest Conservation-related Legislation

[463] Dan Berman, *Lawmakers Seek Answers on Forest Service's Carbon Credits Plan,* GREENWIRE (08/17/2007).

Healthy Farms, Food, and Fuel Act (H.R. 1551 and S. 919)
These bills include provisions for promoting forest stewardship practices through cost-share and incentive payments to non-industrial private forest owners. These forest owners are eligible for these payment programs if they implement conservation activities to improve water quality or habitat for at-risk species, restore ecologically important forest types, or control invasive species. Priority will be given to projects that involve landowners that are coordinating to implement any of these activities.

Wetlands-related Regulation

Proposed Wetland Compensatory Mitigation
In March 2006, the U.S. Environmental Protection Agency (EPA) and the U.S. Army Corps of Engineers (Corps) announced proposed Compensatory Mitigation rules. The rule has not been finalized and there is no expected release date.

The rules are designed to make compensatory mitigation more effective at replacing lost wetland functionality and acreage. They are written to ensure an increase in public participation in decision-making related to compensatory mitigation and approving mitigation banks. Specifically the proposed rule *as written*:

- Establishes standards and criteria for all mitigation methods;
- Affirms mitigation sequencing (avoidance, minimization and compensatory mitigation);
- Requires the watershed approach to compensatory mitigation;
- Prescribes standards for choosing appropriate mitigation, including site selection, "in-kind" replacement, replacement ratios, the use of banks, the use of preservation, and buffer mitigation;
- Sets administrative requirements and performance standards;
- Addresses mitigation banking establishment and credit withdrawal; and
- Eliminates in-lieu fee (ILF) mitigation as an option for providing compensatory mitigation.[464]

It also will promote innovation and focus on results. "In order to ensure successful resource replacement projects, the proposed standards establish sound and enforceable administrative requirements for all types of compensation projects concerning: [r]eal estate instruments that protect the site; [f]inancial assurances for near- and long-term site stewardship; [m]onitoring and contingency planning; and [i]dentification of parties responsible for project tasks."[465]

[464] Compensatory Mitigation for Losses of Aquatic Resources, 71 Fed. Reg. 15,520 (2006) (to be codified at 33 C.F.R. pt. 325 and 332, and 40 C.F.R. pt. 230) (proposed Mar. 28, 2006). p. 15, 521.
[465] U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers, *Proposed Wetlands Conservation Rule, available at* http://www.epa.gov/owow/wetlands/pdf/CompMitRuleFactsheet.pdf [last accessed Aug. 7, 2007].

Regional Internet Bank Information and Tracking System
The Corps' Engineer Research and Development Center has developed the Regional Internet Bank Information Tracking System (RIBITS) as a tool to monitor wetland mitigation banking. With RIBITS a Corps District can track the bank status, monitor credits and debits, view credit reports, and respond to requests for information. Currently, RIBITS is only implemented in the Mobile and Norfolk Districts;[466] however, it has recently been deployed in the Sacramento and Portland Districts as well, and these are expected to be up and running by the end of the year.[467]

Endangered Species-related Legislation

Endangered Species Recovery Act 2007
Both the House and the Senate have proposed bills that would amend the Internal Revenue Code to provide a tax credit to private land owners who enter into conservation easements to protect endangered and threatened species habitat on their lands. In addition, the two versions of the Endangered Species Recovery Act include incentives to restore habitat.

Endangered species recovery tax credit would be given for entering into conservation protection easements and for restoration activities. If a landowner puts his/ her land into a perpetual easement, then the landowner would receive 100 percent of the difference in value of his/ her land prior to and after putting his land into an easement. A 30-year easement would provide a landowner 75 percent of the difference. The bill also would require landowners who put land into easements and receive this credit to develop a habitat management plan.

Habitat restoration tax credit is given to landowners who enter into agreements to conduct restoration on their lands. The provisions of the bill ensure that credit will not be given for activities already required under other laws or that are being carried out and funded as a part of other conservation programs. Habitat management plans also are required. The three types of restoration for which a landowner may receive credit include the following: "100 percent of the restoration costs to the taxpayer during the taxable year for a permanent agreement, 75 percent of the costs for a 30-year agreement, and 50 percent of the costs for any other timeframe."[468] The bill also allows landowners to receive deductions for implementing recommended actions in recovery plans.

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[466] U.S. Army Corps of Engineers, *Regional Internet Bank Information Tracking System, at* http://www.erdc.usace.army.mil/pls/erdcpub/!www_fact_sheet.product_page?ps_product_numb=114145&tmp_Main_Topic=&page=PROBLEM&page=STATUS#STATUS [last updated Feb. 2, 2007].
[467] Personal communication with Jessica Wilkinson, Environmental Law Institute (Jul. 10, 2007).
[468] Defenders of Wildlife, *Endangered Species Recovery Act 2007, at* http://www.defenders.org/programs_and_policy/policy_and_legislation/endangered_species_act/endangered_species_recovery_act_of_2007.php [last accessed Aug. 22, 2007].

Healthy Farms, Food, and Fuel Act (H.R. 1551 and S. 919) and EAT Healthy America Act (H.R. 1600)

These bills require that various USDA programs such as the Conservation Reserve, Wetland Reserve, Grassland Reserve, and Wildlife Habitat Incentive Programs establish a priority for protecting and restoring the habitat of federal and state endangered, threatened, candidate, and rare species as a part of their programs. Both the Farm, Nutrition, and Community Investment Act of 2007 (S. 1424) and the Nourish Act of 2007 (H.R. 2401) set related priorities for similar programs.[469]

Other Related Legislation

Chesapeake Bay Restoration Enhancement Act of 2007 (H.R. 16)

This Act would amend the CWA to change the way grants under the Chesapeake Bay Agreement are implemented and monitored. Specifically, federal agencies carrying out projects within the watershed must ensure the projects comply with the Agreement and participate in restoration and planning activities. Chesapeake Bay states must provide the EPA information on their progress in meeting their Tributary Strategy nutrient reduction goals, and the EPA must report on this progress. Additionally, the EPA is required to establish a program to provide assistance to states, local agencies, and non-governmental organizations to help implement these strategies.

[469] Congressional Research Service, *The Endangered Species Act (ESA) in the 110th Congress: Conflicting Values and Difficult Choices (Jun. 7, 2007), available at* http://www.ncseonline.org/nle/crsreports/07Jul/RL33779.pdf.

Chesapeake Bay States' Pending Legislation

ALL STATES

Draft Proposed 2007 Directive "Protecting the Forests of the Chesapeake Watershed"
The Forestry Workgroup of the Chesapeake Bay Program is drafting a directive on forest conservation within the Chesapeake Bay watershed. This directive is in response to Directive 06-1 (*see* "Maryland" below).

PENNSYLVANIA

Comprehensive Climate Strategy for Pennsylvania
Pennsylvania will be releasing its comprehensive climate change strategy in early 2008. It will encompass all greenhouse gases sources and sinks, not only power plants. The state has been looking at all types of development related to, and practical aspects of, sequestering carbon, including farming methods.[470]

Pennsylvania Global Warming Act (S.B. 266)
This Act requires the development of a report on "potential global warming impacts and economic opportunities for this Commonwealth, for duties of the Department of Environmental Protection, for an inventory of greenhouse gases, for creation of stakeholder process, for a voluntary registry of greenhouse gas emissions and for a climate change action plan."

Resource Enhancement and Protection Tax Credit Program Act (S.B. 690)
This Act would provide financial assistance to private landowners for implementing best management practices (BMPs) on agricultural lands and forested riparian buffers in recognition that BMPs would significantly help reduce nutrient runoff.

S.B. 533
This bill would establish land banks in municipalities. The banks would be administered by municipalities for purchasing open space.

WEST VIRGINIA

West Virginia Potomac River Banking and Trading Program
See Task 1 deliverable for more information.

MARYLAND

Maryland Commission on Climate Change

[470] Personal communication with Daniel Desmond, Pennsylvania Department of Environmental Protection (Jul. 13, 2007).

The Commission was established in April 2007 by Executive Order 01.01.2007.07. The primary goal for the Commission is to establish a plan of action to address climate change by April 2008. The plan will outline the causes of climate change and identify and prepare for the potential impacts to Maryland. It also will include specific benchmarks and timelines for addressing the included recommendations from the Commission. The first update on the plan is due November 1, 2007.[471]

The Commission has three working groups. The Adaptation and Response Working Group is responsible for recommending strategies to reduce the vulnerability of coastal, natural, and cultural resources and communities to the effects of climate change. It also is responsible for developing a Comprehensive Strategy for Reducing Maryland's Climate Change Vulnerability. The Greenhouse Gas and Carbon Mitigation Working Group has the responsibility of analyzing and developing goals to reduce GHG emissions and developing a Comprehensive Greenhouse Gas and Carbon Footprint Reduction Strategy. The Scientific and Technical Working Group was formed to advise the Commission and working groups on the science and technical issues relating to climate change and to put together a Comprehensive Climate Change Impact Assessment.[472]

Long-term Forest Conservation Goal in Maryland/ Chesapeake Bay

The Chesapeake Executive Council signed Directive 06-1 in September 2006 that commits to developing a Chesapeake Bay-wide forest conservation goal in the fall of 2007. In this Directive, each state and the District of Columbia committed to developing goals and frameworks for protecting forested lands. The Governor of Maryland committed resources to developing its state forest conservation goal by April 2007.[473] In the draft goal, the state aims to maintain existing levels of forest cover, which are approximately 41 percent, and expand coverage in areas of greater benefit to "water quality, habitat, and rural economies." Five specific goals include:

1. Extent Matters: Retain existing levels of forest cover in Maryland, estimated at 2.6 million acres.
2. Location Matters: Protect 1.25 million acres in Maryland in forest cover, targeting areas with high value for water quality, conserving and expanding forests located in areas such as stream and shoreline buffers, wetlands, and steep slopes.
3. Streams Matter: Protect 70% of stream and shoreline buffers from development long-term (35-ft minimum, preferably 100 feet).
4. Context Matters: Develop guidelines to retain at least 65-70% of watershed area in rural land uses, with forest targets based on landscape characteristics like steep slopes, buffers, wetlands, existing and planned developed areas, and prime agricultural soils.

[471] Maryland Commission on Climate Change, *at* http://www.mdclimatechange.us/ [last accessed Aug. 22, 2007].
[472] Maryland Commission on Climate Change, *at* http://www.mdclimatechange.us/ [last accessed Aug. 22, 2007].
[473] Maryland Department of Natural Resources, *Current Forest Conservation Efforts in Maryland, at* http://www.dnr.state.md.us/forests/conservationgoal.asp [last accessed Aug. 22, 2007].

5. Communities Matter: Set urban canopy cover goals in Maryland's municipalities and urbanized areas, focusing on areas developed before stormwater management requirements.[474]

Goals for 2020 also are included as well as specific measures for addressing water quality and priority forest conservation actions.[475]

VIRGINIA

Tree Conservation (S. 939, H.B. 2486)

This legislation would allow certain localities, through ordinance, to require conservation of trees during the development process. The bill also states that the tree conservation ordinance may require that subdivision or development site plans provide for the "preservation and replacement of trees" on the development site. Minimum tree canopy or cover[476] percentages for 10 years after development also are outlined: (i) 10 percent tree canopy for a site zoned business, commercial, or industrial; (ii) 10 percent tree canopy for a residential site zoned 20 or more units per acre; (iii) 15 percent tree canopy for a residential site zoned more than 10 but less than 20 units per acre; (iv) 20 percent tree canopy for a residential site zoned more than five but not more than 10 units per acre; and (v) 30 percent tree canopy for a residential site zoned one to five units per acre. Finally, the bill mandates that any tree conservation ordinance provide for reasonable exceptions to or deviations from the canopy requirements.[477]

NEW YORK

Forest-related Legislation

S 01120

This bill would amend N.Y. REAL PROP. TAX tit. 2 § 480 to allow for foresters who are certified by a body such as the Forest Stewardship Council to receive a tax credit (this expands eligibility from only forest land owners who have a forest management plan to include certified forest land owners).

S02396

This bill decreases the amount of forest a landowner must own from 50 to 25 acres to be eligible for a tax credit under N.Y. REAL PROP. TAX tit. 2 § 480.

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[474] Forest Conservation Goals- Maryland, Draft (Jun. 4, 2007), available at http://www.dnr.state.md.us/forests/pdfs/MFCP43007.pdf.

[475] *Id.*

[476] Tree canopy and cover are defined as "all areas of coverage by self-supporting and healthy woody plant material exceeding five feet in height, and the extent of planted tree canopy at 10-years maturity. Calculation of the amount of planted canopy projected to be present 10 years after development shall be based on published reference texts generally accepted by landscape architects, nurserymen, and arborists in the community and the texts shall be specified in the ordinance." S.B. 939, 2007 Sess. (Va. 2007).

[477] S.B. 939, 2007 Sess. (Va. 2007).

S 5538--A
This bill would amend the tax law to allow landowners to get tax credits for entering into an agreement with the New York Department of Environmental Conservation (NY DEC) and committing lands to forest stewardship or habitat conservation. The credit will be for "25 percent "of the allowable school district, county and town and real property taxes on such land" and not more than $1,000 in a year. In addition, the credit allowed will not be in combination with any other credit for that school district, county, or town. Landowners with eligible tracts[478] must apply to the NY DEC to enter into an agreement to have its land included in the Forest Stewardship and Habitat Conservation Program. To enter into an agreement with the NY DEC for forest stewardship, the applicant must show that the forest has been certified for at least five years. To enter into an agreement for habitat conservation, a landowner must agree to develop a habitat conservation plan.

Wetland-related Legislation

A 5957, S. 2390
This bill would authorize the creation, maintenance, and regulation of mitigation banks for both freshwater and tidal wetlands through amendments to the "environmental conservation law [ECL], the highway law, the public authorities law, the state finance law, and the limited liability company law and the court of claims act."

Sections one through five would amend ECL Article 24 to include stricter requirements for the use of freshwater mitigation and to authorize use of freshwater mitigation banks. It also would allow use of bank credits to protect existing freshwater wetlands. Sections six through eight would amend ECL Article 25 to include the same provisions for tidal wetlands. The bill would also add an Article 26 that would govern the establishment and use of mitigation banks. Specifically, the additional article establishes Wetlands Mitigation Banking Committee,[479] banking criteria,[480] banking joint ventures and partnerships,[481] banking permit applications,[482] banking credit generation criteria,[483] mitigation service areas,[484] and land use restrictions for banks.[485]

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[478] Eligible tracts include the following: "a tract of land of at least twenty-five contiguous acres that has been inspected by the Department of Environmental Conservation, a wildlife biologist certified by the Wildlife Society, or a fisheries biologist certified by the American Fisheries Society, and based on such inspection is determined by the Department of Environmental Conservation to be: valuable habitat for wildlife, fish, shellfish or crustacean; or safe and suitable for fish or wildlife-related recreation, including fishing, hunting, trapping and wildlife observation; or both. Land divided by only federal, state, county or town roads, easements or rights-of-way, or energy transmission corridors or similar facilities shall be considered contiguous for purposes of this section."
[479] A. 5957, 2007 Sess. § 26-0107 (2007).
[480] *Id.* § 26-0113 (2007).
[481] *Id.* § 26-0117 (2007).
[482] *Id.* § 26-0119 (2007).
[483] *Id.* § 26-0121 (2007).
[484] *Id.* § 26- 0127 (2007).
[485] *Id.* § 26- 0129 (2007).

Carbon Trading-related Legislation

RGGI Rule
The proposed Regional Greenhouse Gas Initiative Rule requires that all CO_2 budget sources that are required to have a permit under ECL § 201 apply for a CO_2 budget permit. These permitees also must operate their budget sources and units in compliance with the CO_2 budget permit. The rule establishes a process to allocate emissions through a transparent, open auction as opposed to the more traditional "giveaway" allocation method. The proposed rule also would allow industrial electricity generators that sell less than 10 percent of their energy to the grid to apply for an exemption by January 2008. Emissions will be capped in 2009 at current levels, which are 64.3 million tons. Power plants also will be able to purchase offset credits from outside of RGGI states provided that it takes place under the regulatory supervision of a cooperating agency in that state.[486] (*See* Task 2 deliverable for more information.)

A. 7352
This bill establishes regulatory control over offset providers and requires that the Secretary of State and the NY DEC establish licensing requirements for offset providers and implement regulations.

A. 3414 and S. 6276
These bills would establish a program to research greenhouse gases management, research, and development program to research technologies to avoid, abate, mitigate, and sequester carbon.

DELAWARE

Senate Concurrent Resolution No. 28
This resolution requires the Delaware Department of Natural Resources and Environmental Conservation to convene a working group to "study the RGGI MOU, analyze the actions of other RGGI states, and consider and recommend the best course of action for Delaware, noting particularly the quantity of allowances to be auctioned and the potential for use of any revenue to further the goals of the Sustainable Energy Utility or such other goals the Workgroup may consider and that are consistent with the RGGI MOU." The report from the working group is due on December 31, 2007.

WASHINGTON, D.C.
No pending legislation.

[486] New York Department of Environmental Conservation, *Notice of Pre-Proposal of New York's RGGI Rule, at* http://www.dec.ny.gov/regulations/26450.html [last accessed Jul. 11, 2007].

Pending Climate Change Senate and House Bills

Low Carbon Economy Act of 2007 (Bingaman/ Specter S. 1766)

Summary
The bill seeks to establish an economy-wide cap-and-trade program that includes cost mitigation measures; the flexibility to adjust the caps based on scientific information and the efforts of other countries to limit their emissions; an advanced energy technology deployment program; a program to fund adaptation activities; and a program to assist low-income persons affected by the costs of climate change and mitigation measures.

Trading Provisions
This bill would allow for trading. The Secretary of Energy would be responsible for setting up the trading system. A safety-valve price is established at $12/ ton carbon dioxide ($CO_2$) emissions, to increase by approximately five percent per year. The bill also permits banking of allowances. Allocations will be made based on the following provisions:

- 10% of all allowances from 2012-2016 will be auctioned, increasing by 2% per year thereafter to a maximum of 65%;
- 55% of all allowances from 2012-2016 will be allocated to industry, declining by 2% each year thereafter;
- 29% of all allowances from 2012-2021 will be allocated to states, 30% each year thereafter;
- 5% of all allowances will be allocated to agricultural sequestration projects each year;
- 1% of all allowances from 2012 to 2021 will be early reduction allowances; zero thereafter.[487]

Sequestration provisions
The bill establishes provisions for domestic offsets and credits. The Secretary of Energy would be responsible for promulgating regulations establishing credits for domestic offset projects, programs to grant allowances for early reduction actions, and programs to grant allowances for sequestration. The Secretary of Agriculture is responsible for promulgating regulations establishing programs to grant allowances for soil sequestration.[488]

Projects eligible for receiving credits for offsetting carbon include:

(A) landfill methane use projects;
(B) animal waste or municipal wastewater methane use projects;
(C) projects to reduce sulfur hexafluoride emissions from transformers;
(D) coal mine methane use projects; and
(E) such other categories of projects as the President may specify by rule.[489]

[487] S. 1766, 110th Cong. §§ 201 to 208 (2007).
[488] S. 1766, 110th Cong. §§ 205 to 208 (2007).
[489] S. 1766, 110th Cong. § 302(B)(2) (2007).

Applicants for greenhouse gas sequestration projects project must "provide the President with information verifying that, as determined by the President, the entity has achieved actual increases in net sequestration, taking into account the total use of materials and energy by the entity in carrying out the sequestration."[490]

Global Warming Pollution Reduction Act (Sanders/ Boxer S. 309)

The scope of the draft bill is economy-wide and covers all six of the greenhouse gases (GHGs), which are CO_2, methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFC), perfluorocarbons (PFC), and sulfur hexafluoride (SF_6). In addition, the bill also covers any other anthropogenically-emitted gases that the Administrator of the U.S. Environmental Protection Agency (EPA) notices and determines contributes to global warming.[491]

The long-term goal of the draft bill is to have an average global atmospheric concentration of global warming pollutants not greater than 450 parts per million (ppm) in carbon dioxide equivalent and to ensure that the average global temperature increase does not exceed 3.6 degrees Fahrenheit.[492]

Trading

The bill leaves the decision to establish a cap and trade program to the EPA. Allowance allocations also must be set by the EPA.

Sequestration

The bill allows the Secretary of Agriculture to establish programs to grant allowances for biological sequestration. The EPA Administrator may allocate emission allowances to "such individuals and entities as the Administrator determines to be appropriate, for use in carrying out projects to reduce net carbon dioxide emissions through above-ground and below-ground biological carbon dioxide sequestration (including sequestration in forests, forest soils, agricultural soils, rangeland, or grassland in the United States)."[493] The Secretary of Agriculture also is required to establish standards for biological sequestration within two years of passing this legislation.[494]

Clean Power Act 2007 (Sanders S. 1201)

Summary

This bill targets the electric sector. It includes all six GHGs and also puts a cap on the emission of sulfur dioxide (SO_2), nitrogen oxides (NOx), and mercury. The bill is also open to inclusion of any other anthropogenically-emitted gas that the EPA determines contributes to global warming. In addition, it establishes an energy efficiency program, a renewable portfolio standard, and a program to deploy geological carbon sequestration.

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[490] S. 1766, 110th Cong. § 601(c) (2007).
[491] S. 309, 110th Cong. § 703(4) (2007).
[492] S. 309, 110th Cong. § 702 (3) (2007).
[493] S. 309, 110th Cong. § 706 (2007).
[494] S. 309, 110th Cong. § Sec 714 (2007).

Trading
This bill contemplates a trading program but does not specify its details. It does set out allowance allocations, which do not include agricultural sequestration. EPA will be responsible for setting allowance allocations. In 2010 at least 50 percent of the allowances will be auctioned and from 2011 to 2026 there will be a gradual increase up to 100 percent auction.

Sequestration
The bill allows the Secretary of Agriculture to establish programs to grant allowances for biological sequestration. The EPA Administrator may allocate emission allowances to "such individuals and entities as the Administrator determines to be appropriate, for use in carrying out projects to reduce net carbon dioxide emissions through above-ground and below-ground biological carbon dioxide sequestration (including sequestration in forests, forest soils, agricultural soils, rangeland, or grassland in the United States)."[495] The Secretary of Agriculture also would be required to establish standards for biological sequestration within two years of passing this legislation.[496]

Climate Stewardship and Innovation Act of 2007 (Lieberman/ McCain, S. 280)

Summary
This bill seeks to reduce the Nation's GHG emissions between 2007 and 2050 without weakening the economic position of the United States or imposing hardship on its citizens. The coverage of the bill is economy wide (electric, transportation, industry, and commercial sectors) and it covers all six of the greenhouse gases. Entities covered by the draft bill include electric, industrial and commercial facilities (e.g., power generation and other large emission sources) that emit 10,000 metric tons or more of GHGs per year as measured in units of CO_2 equivalents and entities that refine or import petroleum products for use in transportation, or that import PFCs, HFCs, and SF_6 that, when used, will emit 10,000 metric tons or more of GHGs per year.

Trading
The bill allows for inter-sector trading and banking. The EPA will be responsible for setting up the permits for these programs.[497] Allowance allocations and the auction versus gratis split will be set by the EPA and Secretary of Commerce with oversight from the Senate Environment and Public Works Committee. The EPA also may grant allowance for early reduction action. The EPA also grants an allotment of allowances to the Climate Change Credit Corporation, which are auctioned and proceeds fund technology programs.

Sequestration
The Secretary of Commerce is responsible for promulgating regulations to establish programs that grant allowances for agricultural sequestration projects to serve as domestic offsets. Starting in 2012, a regulated entity may offset up to 30 percent of its

[495] S. 1201, 110th Cong. § 708(B) (2007).
[496] S. 1201, 110th Cong. § 7146 (2007).
[497] S. 280, 110th Cong. §§ 124, 125, 142 (2007).

emissions through purchase of offsets. Greenhouse gas reductions may be purchased by a non-covered entity if the reduction is recorded in the greenhouse gas registry. In addition, "[i]f a covered entity chooses to satisfy more than 15 percent of its total allowance submission requirements under the provisions of subsection (a), it shall satisfy at least 1.5 percent of its total allowance submission requirement by submitting registered net increases in sequestration in agricultural soils, as registered in the database, adjusted, if necessary, to comply with the accounting standards and methods established under this section."[498]

Global Warming Reduction Act (Kerry/ Snowe, S. 485)

Summary
The scope of the draft bill is economy-wide. The draft bill also covers all six GHGs and any other gas that contributes to global warming. The bill's long-term goal is an average global atmospheric concentration of global warming pollutants not greater than 450 parts per million (ppm) and a 65 percent reduction in global warming pollution emissions in the U.S. as compared with emissions for the year 2000. Other notable goals are to: a) maximize public benefits and promote economic growth; b) mitigate the effect of any energy cost increases to consumers, particularly low-income consumers; c) provide equitable transition assistance to any employees and regions affected by a transition away from the use of high carbon-emitting energy source; d) encourage research, development, and commercial deployment of innovative technologies for avoiding, reducing, or sequestering emissions of pollutants; e) encourage reduced carbon emissions from, and enhanced sequestration of, carbon in the forest and agricultural sector; f) recognize and reward early reductions of greenhouse gases; and g) support activities to protect against and mitigate the impacts of climate change.

Trading
A tradable allowance program is authorized, and the EPA Administrator will be responsible for overseeing the program if established. Allowances also may be banked. The President will be responsible for developing the allocation plan including the auction/ gratis split and the amount of allowances allocated to the Climate Reinvestment Fund with oversight from Congress. The Fund will be controlled by the Treasury.[499]

Sequestration
As with other bills, the Secretary of Agriculture may promulgate regulations to establish programs to grant allowances for biological sequestration. The Secretary also must establish standards for biological sequestration.[500]

Electric Utility Cap and Trade Act (Feinstein/ Carper, S. 317)

Summary

[498] S. 280, 110th Cong. § 144(a), (b) (2007).
[499] S. 485, 110th Cong. § 703 et seq (2007).
[500] S. 485, 110th Cong. § 708 et seq (2007).

The scope of this bill is the electric sector. The draft bill includes all six GHGs. All electric generating entities of 25 megawatts or greater are regulated, including cogeneration and government owned facilities. The bill also provides for the establishment of a climate action trust fund.

Trading
This bill authorizes the EPA to establish a trading system that (1) may allow allowance borrowing and 1 for 1 repayment plus interest; (2) may permit state level allowances to be used in federal program; (3) permits banking of allowances; and (4) may in 2015 modify the cap and reduction goals.[501]

Allocations will be made according to the following provisions for auctioned and gratis allowances:

Auction
- 2011: 15 percent auction, remainder gratis
- 2012-2031: additional 3 percent per year auctioned
- 2031-2036: additional 5 percent per year auctioned
- 2036 and thereafter: 100 percent auctioned[502]

Gratis
- Allocation based on electricity generation output
- No allocation to new coal unless meeting "Clean Coal" definition[503]

Sequestration
The EPA may promulgate regulations establishing programs to grant allowances for early reduction actions and to certify GHG offsets. The Secretary of Agriculture may promulgate regulations establishing programs to certify agricultural, wetland, and forest management offsets as well as offsets from other land use-related sequestration projects. Projects are eligible to generate sequestration credits if they commence on or after January 1, 2011. Agriculture operations that sequester carbon may commence prior to January 1, 2011, but only sequestration flows that occur on or after January 1, 2011 will be eligible for offsets. The USDA also must account for regional discount factors. Regulations also must outline geographic regions and "define baseline historical reference periods for each category of sequestration practice, using the most recent period of sufficient length for which there are reasonably comprehensive data available." However, if "entities have increased implementation of the relevant offset practice during the most recent period in anticipation of legislation granting credit for the offsets…[then the USDA] may define baseline historical reference periods for each category of sequestration practice using an earlier period."[504] The bill also outlines provisions for establishing regulations for quantifying sequestration flow and using native plants for offset projects.

[501] S. 317, 110th Cong. § 721 (2007).
[502] S. 317, 110th Cong. § 714 (2007).
[503] S. 317, 110th Cong. § 714 (2007).
[504] S. 317, 110th Cong. § 732(c) (2007).

Eligible agriculture projects include:

(1) Agricultural sequestration practices
    (A) no-till agriculture;
    (B) conservation tillage (ridge till or minimum till);
    (C) winter cover cropping;
    (D) switching from a cycle of--
        (i) planting wheat or other crops and then fallowing land; to
        (ii) continuous cropping;
(2) Any other offset practices identified by the Administrator, in consultation with the Secretary of Agriculture;
(3) Combinations of any of the offset practices described; and
(4) Conversion of cropland to rangeland or grassland.[505]

Eligible forest and wetland projects include "activities that reduce greenhouse gases as a result of forest management sequestration projects (including afforestation), other than avoided forest land conversion." However, "no afforestation project may involve the planting of invasive species or noxious weeds" and "no afforestation project may involve planting trees on existing native grassland or other existing native non-forested ecosystems that the Secretary of Agriculture determines should be protected in their existing native condition."[506]

Wetland management offset projects must "provide durable, long-term reductions in greenhouse gases as a result of sequestration." "No wetlands restoration project may involve the planting of invasive species or noxious weeds," and no wetlands offset project may be carried out in an area in which underlying local hydrologic processes will not support a wetland."[507] Offsets may only be generated for avoiding conversion of forested lands or wetlands if the conversion is below "expected" levels.[508]

Clean Air/ Climate Change Act of 2007 (Alexander/ Lieberman, S. 1168)

Summary
This bill targets the electric sector. It includes all six GHGs and also puts a cap on the emission of SO_2, NOx, and mercury.

Trading
No provisions specified. The President must submit a plan to Congress for distributing the allowances through auctions and is also given the discretion to allocate the allowances.

Sequestration

[505] S. 317, 110th Cong. § 733 (2007).
[506] S. 317, 110th Cong. § 734 (2007).
[507] *Id.*
[508] S. 317, 110th Cong. § 735 (2007).

The bill includes a GHG offset provision that allows for up to 100 percent offsets and provides for offset allowances for a variety of projects, including the capture and destruction of landfill methane, carbon sequestration through afforestation, prevention of methane emissions through agricultural manure management operations, and others. EPA and the Secretary of Agriculture shall promulgate regulations relating to GHG offsets produced by agricultural sequestration practices.[509]

Eligible projects also include afforestation and reforestation projects. A project that converts nonforested land to forested land may receive allowances if the project is located on land that has been nonforested for at least 10 years. The project also must not be a common practice in the "area where the offset project will take place; managed in accordance with widely-accepted environmentally sustainable forestry practices; and designed to promote restoration of native forests by using mainly native species and avoiding the introduction of invasive nonnative species."[510] In addition, certification (Forest Stewardship Council, Sustainable Forestry Institute, American Tree Farm System, or similar organization) must be obtained prior to beginning any commercial timber harvest activities.[511] The bill also includes provisions for calculating carbon sequestration baselines, sequestration allowances, and monitoring and verification.[512]

Prohibitions include:

> (1) An offset allowance may not be awarded for an offset project that is required to be carried out pursuant to any Federal, State, or local law (including a regulation), other than this Act , or administrative or judicial order;
> (2) Offset allowances shall not be awarded to an offset project that includes an electric generation component; and
> (3) An offset allowance shall not be awarded to an offset project that is awarded credits or allowances under any other mandatory or voluntary greenhouse gas program, as determined by the Administrator.[513]

Clean Air Planning Act of 2007 (Carper, S. 1177)

Summary
This bill covers the electric sector. It includes all six GHGs and also puts a cap on the emission of sulfur dioxide, NOx, and mercury.

Trading
The bill provides for CO_2 allowance trading but does not include banking provisions. The EPA will be responsible for promulgating regulations for the trading program within two years of passing this legislation. Allocations to covered entities would be based on a hybrid auction/gratis allocation for carbon dioxide (CO_2). Allowances to units would

[509] S. 1168, 110th Cong. § 201 (2007).
[510] S. 1168, 110th Cong. § 803(c) (2007).
[511] S. 1168, 110th Cong. § 803(c) (2007).
[512] S. 1168, 110th Cong. § 803 et seq (2007).
[513] S. 1186, 110th Cong. § 802(c) (2007).

primarily be based on average quantity of electricity used during the most recent three year period for which data are available. Therefore, it would be allocated based on historic data (grandfathered). Auctions would be increased each year. Starting at 2012, allowances to be auctioned would be 18 percent. This would be increased by three percent per year for 2012 through 2031. From 2031 through 2035 allocations to be auctioned would increase at 5 percent per year, so that by 2036 there would be 100 percent auctioning.[514]

Sequestration
Offsets will be allowed in the carbon trading program, and the EPA will promulgate the related regulations in consultation with the Secretary of Agriculture. In developing these regulations, the EPA will "take into consideration offset methods developed, as of the date of enactment of this title, by the State of California or any other State pursuant to the Regional Greenhouse Gas Initiative or a similar regulatory program of comparable rigor."[515]

Offset projects may include agricultural manure management projects and soil sequestration projects; "forest based projects, including conservation-based forest management projects, reforestation projects, and conservation projects;" and wastewater treatment facilities.[516]

Safe Climate Act of 2007 (Waxman, H.R. 1590)

Summary
In addition to establishing an economy-wide cap-and-trade program for certain sources and sectors, this bill provides for motor vehicle emissions standards that meet California's standards, establishes a national renewable energy standard; and establishes a national energy efficiency standard.

Trading
The bill provides for both trading and banking allowances. The President, along with the EPA, shall submit to Congress an allocation plan that includes a combination of auctions and free allocations of allowances. The allocations and revenues received should maximize public benefits, promote economic growth, assist households and dislocated workers, encourage energy efficiency and renewable energy activities, sequestration activities, and assist States in addressing the impact of climate change.[517] Proceeds from auctions will be invested into the Climate Reinvestment Fund. The use of the funds will be specified in an appropriations bill.

Sequestration
The bill includes no carbon offset provisions. However, it does note that allocations should encourage sequestration activities.

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[514] S. 1177, 110th Cong. § 706 et seq (2007).
[515] S. 1177, 110th Cong. § 705(f) (2007).
[516] *Id.*
[517] H.R. 1590, 110th Cong. § 704 (2007).

Climate Stewardship Act of 2007 (Olver, H.R. 620)

Summary
This economy-wide bill covers the electric power, transportation, industrial, and commercial sectors. All facilities that emit 10,000 metric tons of greenhouse gas per year, measured in units of carbon dioxide equivalents. The bill also includes petroleum refineries and importers of refined petroleum, hydroflourocarbons, PFCs, SF_6, and other greenhouse gases that when used will emit over 10,000 tons of greenhouse gases per year measured in CO_2 equivalents. It covers all six GHGs.

Trading
Tradeable allowances can be traded, banked, or borrowed against future reductions.[518] The EPA shall determine allocations based on several economic, equity, and non-specific criteria including economy efficiency, competitive effects, and impact on consumers.[519] Allowances are to be allocated upstream to refiners and importers of transportation fuel, along with producers of HFCs, PFCs, and SF_6, and downstream to electric generation, industrial, and commercial entities. Allocations to covered entities are provided at no cost.[520] Entities may receive credit for early reductions registered prior to 2012.[521]

Sequestration
A covered entity may cover up to 15 percent of its total allowance through domestic carbon sequestration and reduction from non-covered entities. [522]

A Climate Change Credit Corporation would be established by this bill, and its funds would be used in a variety of ways, including to create and implement a technology deployment program to support compliance with the Act, including agricultural programs and adaptation assistance for fish and wildlife habitat.[523]

Energy Policy Reform and Revitalization Act of 2007 (Rahall, H.R. 2337)

Summary
Although this bill does not establish a cap-and-trade system, it addresses the issue of carbon capture and climate change mitigation through the use of a Geological Sequestration Assessment and a Terrestrial Sequestration Assessment to assess the potential for carbon capture and storage. It also proposes the creation of a carbon dioxide storage inventory for federal leases, and a plan for conducting geological carbon sequestration activities on federal lands.

Trading

[518] H.R. 620, 110th Cong. §§ 141, 142, 143 (2007).
[519] H.R. 620, 110th Cong. § 161 (2007).
[520] H.R. 620, 110th Cong. § 162 (2007).
[521] H.R. 620, 110th Cong. § 164 (2007).
[522] H.R. 620, 110th Cong. § 144 (2007).
[523] H.R. 620, 110th Cong. § 202 (2007).

N/A

Sequestration
N/A

Save Our Climate Act (Stark, H.R. 2069)

Summary
This bill does not establish a cap-and-trade system, but rather proposes to tax the carbon content of fossil fuels. It would impose a $10 per ton (of carbon) charge on coal, petroleum and natural gas when the fuel is either extracted or imported. The charge would increase by $10 every year until U.S. CO_2 emissions have dropped 80 percent from 1990 levels.

Trading
N/A

Sequestration
N/A

America's Energy Trust Fund Act (Larson, H.R. 3416)

Summary
This bill establishes the America's Energy Security Trust Fund, provides tax credits for research and development of alternative energy technology, provides transition assistance to industries affected by the shift to cleaner energy technology, and reduces the payroll take burden on lower income families. The bill also provides a refundable tax credit to entities that use carbon sequestration or carbon capture technology.[524]

Trading
N/A

Sequestration
The law would allow for people implementing offset projects to receive a tax credit or a refund. Projects must reduce GHG, sequester GHG, or destroy hydroflurocarbons.[525]

[524] America's Energy Security Trust Fund Memo [on file with author]; H.R. 3416, 100th Cong. (2007).
[525] H.R. 3416, 110th Cong. § 4692 (2007).

Top 10 Private Easement Programs in the Chesapeake Bay (by acreage enrolled)

Organization	Easements Acres	States	Citation	Contact Information
Eastern Shore Land Conservancy	39,311 (211 properties)	Maryland	Personal communication with Nina White, Eastern Shore Land Conservancy (Aug. 13, 2007).	Nina White, Director of Administration, (410) 827-9756 http://www.eslc.org/
The Nature Conservancy	Approximately 26,750[526]	VA, WV, MD, PA, NY, DE	Personal communication with George Barlow, The Nature Conservancy (Aug. 15, 2007). Personal communication with Michelle Cancik, The Nature Conservancy (Aug. 15, 2007).	George Barlow, Division Attorney, Charlottesville Office (434) 951-0593/ gbarlow@tnc.org Michelle Canick, Maryland Office (301) 897-8570
Lancaster Farmland Trust	16,571 acres (255 farms)	Pennsylvania	Lancaster Farmland Trust, *About, at* http://www.lancasterfarmlandtrust.org/about.html [last accessed Aug. 7, 2007]. Personal communication with Elizabeth Beeman, Lancaster Farmland Trust (Aug. 13, 2007).	Elizabeth Beeman, (717) 687-8484 http://www.lancasterfarmlandtrust.org/
Lower Shore Land Trust	Approximately 13,280	Maryland	Land Trust Alliance, *Lower Shore Land Trust, at* http://www.ltanet.org/findlandtrust/one.tcl?pc_id=8618. The data is based on LTA's 2005 National Land Trust Census.	410-641-4467 http://www.lowershorelandtrust.org/pages/home.php
Valley Conservation Council	Approximately 12,300[527]	Virginia	Personal communication with Jackie Jamison, Valley Conservation Council (Aug. 13, 2007).	Jackie Jamison, Conservation Officer (540) 886-3541 http://www.valleyconservation.org/
Potomac Conservancy	9,202	WV - 7,491 VA - 1,061 MD - 647 DC - 3 29 acres on	Potomac Conservancy, *The Voice of the River, Annual Report 2006*, *available at* http://www.potomac.org/pdfs/pc_ar_2006.pdf;	Monica Lyman (301) 608-1188/ lyman@potomac.org http://www.potomac.org/

[526] The most current estimate for The Nature Conservancy's conservation easement acreage in Virginia is 18,750 acres. The most recent estimate of easement acreage within the entire Bay watershed is from 2006 and totals 20,000. However, 12,000 of these 20,000 acres were in Virginia. Thus, the total included in this table combines the more current estimate of 18,750 acres for Virginia and the 8,000 acres for all the other states within the watershed as of 2006.

[527] Note: Approximately 1,000 acres are held solely by the Council, the rest of the easement acres are co-held with the Virginia Outdoors Foundation (see below).

		islands in the Potomac	Personal communication with Monica Lyman, Potomac Conservancy (Aug. 13, 2007).	
West Virginia Cacapon and Lost Rivers Land Trust	9,333	West Virginia	Personal communication with Nancy Ailes, West Virginia Cacapon and Lost Rivers Trust (Aug. 13, 2007).	Nancy Ailes, Executive Director (304) 856-1010 http://www.capapon.org
Farm and Natural Lands Trust of York County	6,701[528]	Pennsylvania	Personal communication with Michelle Black, Farms and Natural Lands Trust of York County (Aug. 13, 2007).	Michelle Black (717) 843-4411 http://www.farmtrust.org
The Conservation Fund	Approximately 6,000	Watershed-wide	Personal communication with Bill Crouch, The Conservation Fund (Aug. 16, 2007).	Bill crouch, Maryland Office (443) 482-2826 bcrouch@tcfmd.org
Ostego Land Trust, Inc.	4,095	New York	Personal communication with Ostego Land Trust, Inc. (Aug. 13, 2007)	607-547-2366 http://www.otsegolandtrust.org/

****NOTE:** In Virginia, the Virginia Outdoors Foundation (a state-run agency) holds the majority of the state's conservation easements (over 400,000 acres). In Maryland, the quasi-public agency, Maryland Environmental Trust, holds the majority of the state's conservation easements (over 115,000 acres). The Maryland Agricultural Land Preservation Fund, also a state agency, holds easements on approximately 500,000 acres.

[528] Acres include easements that the Trust is currently in the process of establishing.