

What's Going On with Virginia's Wetlands?

*"Nature provides a free lunch, but only if we control our appetites."
~William Ruckelshaus*

Trying to get a complete "picture" for our Commonwealth's wetlands — how many and what types we have, their health and what's happening to them — is not an easy job. Part of the complexity has to do with which wetland definition is used as well as available data and technologies and the interpretation of that data. Scientists, managers and regulators in Virginia are constantly working to get a better idea of this true "picture" of our wetlands, both the current conditions as well as what has happened in the past in order to project future conditions.

How Are Our Wetlands Doing? Status and Trends of Virginia's Wetlands

How many wetlands do we have in Virginia?

Based on the FWS's National Wetlands Inventory (NWI) mapping for the state of Virginia, vegetated wetlands occupy about 1.2 million acres, or about 4.5 percent of Virginia's landmass (Hershner, et al., 2003). This statistic is still not 100% accurate for vegetated wetlands, as the NWI is based on aerial photographs and some types of wetlands, especially small forested nontidal wetlands, are difficult to detect and are most likely underrepresented (Hershner et al., 2003).

What types of wetlands are most abundant in Virginia?

Of the four major NWI wetland classification systems, palustrine wetlands are most abundant, comprising about 83 % (about 1 million acres) of all vegetated wetlands in Virginia. As the pie chart on the next page indicates, estuarine wetlands are the next most prevalent, comprising about 16 % (195,000 acres) of the State's vegetated wetlands. Lacustrine and riverine wetlands account for small percentages, about 220 and 570 acres, respectively (Hershner et al., 2003).

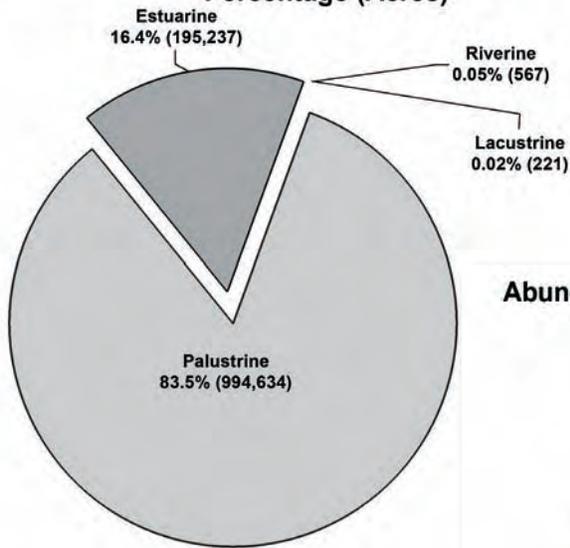
Isolated and headwater wetlands

The Virginia Institute of Marine Science (VIMS) recently performed an analysis looking at the abundance of two types of hydrologically unique wetlands, headwater and isolated wetlands. Based on this analysis, it is estimated that these two wetland types represent over 50% of Virginia's vegetated wetlands (Hershner et al., 2003).

Where are Virginia's wetlands located?

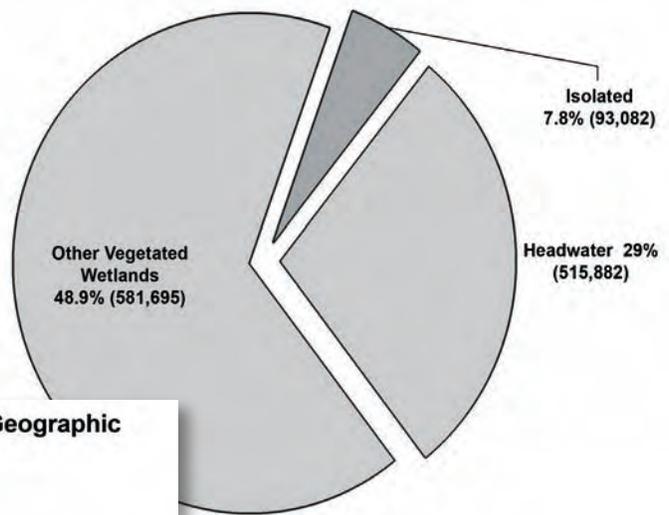
As the pie chart on the next page demonstrates, the majority of Virginia's wetlands (72 percent), including all estuarine wetlands, are located entirely within the Coastal Plain region. Nontidal wetlands are distributed throughout the State and are located primarily in bottomlands and in floodplains along stream channels, especially in headwater areas. About 22 percent of the wetlands in Virginia are in the Piedmont region. The remaining wetlands are located in the Appalachian Plateaus, Blue Ridge and Valley regions. (Augustine, 2002).

**Abundance of Virginia Wetlands by System Types
Percentage (Acres)**



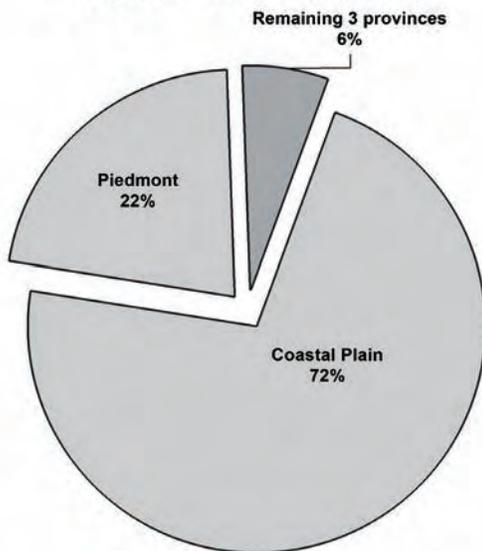
*Adapted from Hershner, et al., 2003.
Note: Analysis includes vegetated wetlands only.*

**Abundance of Isolated and Headwater Wetlands within Virginia
- Percentage (Acres)**



*Adapted from Hershner, et al., 2003.
Note: Analysis includes vegetated wetlands only.*

**Distribution of Vegetated Wetlands within Virginia's Geographic
Regions - Percentage (acres)**



Adapted from Augustine, 2004.

Wetland Loss Hot Spots in Virginia's Chesapeake watershed between 1982-1989 (From CBP, 1997)

Southeastern – 4,000 acres of seasonally saturated and temporarily flooded forested wetlands converted into housing developments and farmland

Piedmont – 17,000 acres of palustrine vegetated wetlands lost, 90% of which was converted into lakes, reservoirs or ponds

Blue Ridge/Appalachian – 34 % of region's palustrine emergent wetlands lost, 80% due to conversion to cropland

Coastal Plain – almost 2,000 acres of palustrine vegetated wetlands lost, 65% due to conversion of forested wetlands into ponds

Although not all of the recent data has been finalized, most experts agree that significant annual wetland losses continued into the 1990s (Augustine, 2004).

Wetland Losses

Virginia, like most of the nation, did not realize the value of wetlands for much of its history and consequently experienced great losses of wetlands during its development. In the 1780's, wetlands are estimated to have covered 1,849,000 acres (more than 7 percent) of Virginia. By the mid-1980's, when permits began to be required for most wetland impacts, it is estimated that only 1,075,000 wetland acres remained -- a loss approximating 42 percent in just 200 years. Activities by man including agriculture, industrial and urban development, and recreation led to the destruction of many wetlands in Virginia through their draining, dredging, ditching, filling, diking and damming (Augustine, 2004).

- **Tulloch Ditching of wetlands** – The term “Tulloch ditching” is used to describe the practice of carefully digging drainage ditches within wetlands to remove all excavated materials from the wetland (Hershner, 1999). The objective of Tulloch ditching is to drain the wetland so that it will no longer be subject to wetlands regulations, creating the potential for alternative uses (Hershner, 1999). The practice became prevalent in Virginia when the United States Court of Appeals for the District of Columbia upheld a ruling, which prevented the Corps from having jurisdiction over this activity to prevent the practice (Hershner, 1999). Between 1998 and 1999, more than 2,500 additional acres of non-tidal wetlands in Virginia were ditched for development, and additional acres of isolated wetlands were destroyed (Augustine, 2004).
- **Headwater and isolated wetlands** – Across the nation, headwater and isolated wetlands were historically the first wetlands areas to be drained and filled. Due to their size or temporary hydrologic nature, they were often not protected because they were not thought to be ecologically important. (Alliance, 2003). These two wetlands types, along with other nontidal wetlands with temporary hydrology are often the most at risk as they are tempting targets for effective drainage via Tulloch ditching (Hershner, 1999).

Luckily, due to changes with Virginia's nontidal wetlands permit program as well as changes with Virginia's Corps permitting program, wetland losses due to Tulloch ditching and in headwaters and isolated wetlands have slowed (Augustine, 2004).

Subaqueous Lands

It should be noted that none of these statistics include Virginia's wealth of subaqueous lands, which include subaquatic vegetation beds and unvegetated areas containing mudflats and oyster beds. Depending on the classification system used and the depth and permanency of the water, these habitats may be considered wetlands or deepwater habitats. Nonetheless, these lands are indeed a valuable resource, providing essential habitat for shellfish, crabs and finfish ([Virginia Marine Resources Commission \[VMRC, n.d.\]](#)). In the tidal portion alone, Virginia has an estimated 1,472,000 acres of state-owned bottomlands. These submerged lands, harbor 21,000 acres of valuable submerged aquatic vegetation and 350,000 acres of oyster grounds (VMRC, n.d.).

You can still hear the tales of the water so clean
of the shad and the sturgeon and the grasses so green
that grew all over the Bay...
...But the water turned cloudy and the shoreline was paved
the harbor grew cloudy
hardly an effort was made
to preserve all the things that we cherished the most
and are blind to the fact that it all may soon be lost “

~ Don Shappelle,, “Chesapeake Dream”

Submerged aquatic vegetation (SAV) – It is estimated that there was at one time at least 200,000 acres of SAV within the tidal portion of the Chesapeake Bay watershed alone. (CBP. n.d.) By 1984, only 38,000 acres of SAV existed within the Bay and tidal tributaries. Since this time, scientists within the Bay region have committed significant resources to determine the causes for the decline as well as the best methods for protecting and restoring SAV populations.

In 2003, the CBP adopted a goal to achieve 185,000 acres of SAV baywide by the year 2010 (CBP. 2004). Virginia’s portion of this goal is 75,093 acres (Dave Wilcox, personal communication, September 16, 2005).

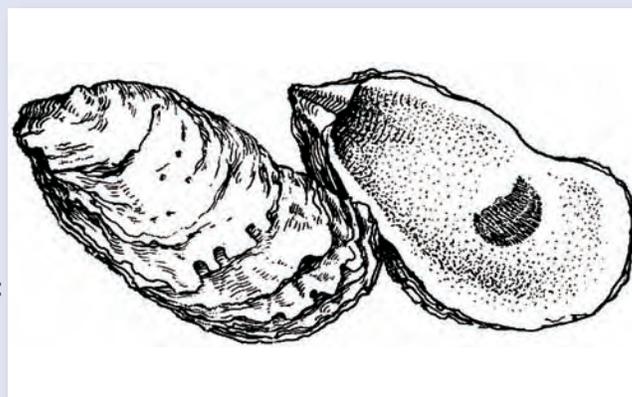
After a period of steady increase from 1984 through 1993, SAV acreage within the tidal portions of Virginia’s Chesapeake Bay has fluctuated around an annual average of approximately 30,000-35,000 acres through 2003. In 2004, SAV acreages for Virginia (28,297 acres) reached the lowest levels recorded since 1987. Changes observed between 2003 and 2004 were likely due to the influence of Hurricane Isabel, primarily by washing out large sections of beds along both the eastern and western lower bay shoreline in September 2003. These decreases in SAV highlights the continued importance to further reduce nutrient and sediment pollution flowing into the Bay. (CBP, May 2005).

Oysters – At one time, *Crassostrea virginica*, the native oyster of the Chesapeake Bay, yielded seasonal harvests of millions of bushels. Even 100 years ago, oyster reefs were so large that they posed a navigational hazard to ships. One traveler commented about our native oyster in 1701:

“The abundance of oysters is incredible. There are whole banks of them so that the ships must avoid them.... They surpass those in England by far in size...they are four times as large. I often cut them in two, before I could put them in my mouth.”

- J. Wharton, *The Bounty of the Chesapeake: Fishing in Colonial Virginia*. University Press of Virginia, Charlottesville, VA (CBP. 2005).

Today, less than 1 percent of the original oyster population remains (CBP. 2005).



Alice Jane Lippson

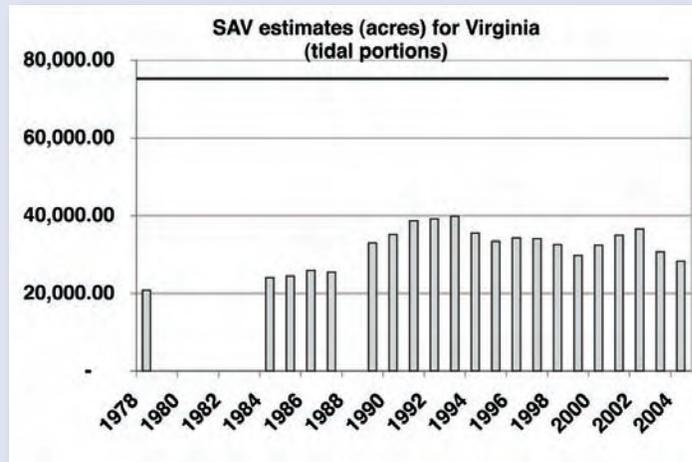
American Oyster



Alice Jane Lippson

Eelgrass, a type of saltwater SAV, serves as important habitat for a wealth of animals, as demonstrated in this diagram.

Data adapted from VIMS as communicated by Dave Wilcox, Sept 16, 2005.



Note: no data is available for years 1978-1983 or 1988. Due to Hurricane Isabel, some data was also not available in 2003. No statistics are available for submerged vegetation in nontidal areas.

How are Virginia Wetlands Protected? Regulations to Ensure “No Net Loss”

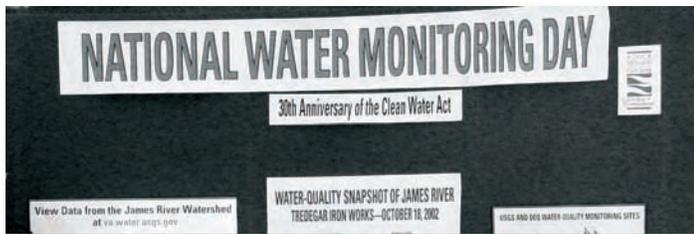
“Ditch It, Fill It, Drain It, Dump It, Dredge It, Dump In It”
– Alliance for the Chesapeake Bay

The above saying was a common sentiment regarding wetlands. People used to view wetlands as a nuisance and something to get rid of. In fact, government policies were even in place to encourage the destruction of wetlands for conversion into agricultural fields and for commercial and residential development (Mitsch & Gosselink, 2000, p. 14).

But over the last quarter century, greater scientific understanding of the functions and values of wetlands has increased the recognition for the need to restore and conserve them. (Heimlich, 1988). As a result, direct and indirect public incentives for wetland conversion have ceased, wetland conversion has been regulated in Federal water quality legislation and in numerous State laws, farm program benefits have been tied to wetland conservation, and voluntary programs have been funded to restore cropland formerly converted from wetlands (Heimlich, 1988).

Federal Regulations

The Clean Water Act



Throughout the 1960's, public awareness regarding the quality of our nation's water resources intensified as a result of highly volatile environmental issues. Thousands of dead fish washing ashore, fouled city drinking water, and lakes catching on fire were all indicative of a highly stressed aquatic system. Pollution was readily observable in much of the nation's rivers, streams and lakes. Government agencies attempted to respond to these problems, often without insight as to the social, legal, economic and environmental consequences of their actions. With a high demand for a more effective means to protect and clean the nation's water resources, Congress in 1972, passed the Federal Water Pollution Control Act Amendments (better known as the Clean Water Act, 33 U.S.C. §§ 1251 et. Seq.) (Year of Clean Water, 2001).

The Clean Water Act set the goal of restoring and maintaining the chemical, physical, and biological integrity of the nation's waters. Since its passage over thirty years ago, Clean Water Act programs have yielded measurable improvements in water quality. As part of the Clean Water Act movement, national attention was directed to wetlands as more science revealed the important roles that they play in healthy watersheds, and thus water quality (Year of Clean Water, 2001).

For more information about the Clean Water Act, visit the following websites:

- <http://www.epa.gov/region5/water/cwa.htm> – contains a history of the Clean Water Act and all of the sections of the Act.
- <http://www.epa.gov/watertrain/cwa/> – Clean Water Act Training Module



National Water Quality Monitoring Day Celebrated along the James River in Richmond, Virginia

Two important sections of the Clean Water Act that pertain to wetlands are Section 404 (**33 U.S.C. 344**) and 401 (**33 U.S.C. 1341**):

- **Section 404 – Avoid, minimize and compensate** – This section of the Clean Water Act states that no **discharge** of dredged or fill material into U.S. waters, including wetlands, can be permitted if a practical alternative exists that is less damaging. Potential impacts to wetlands should be minimized and for unavoidable impacts, compensation should be provided through activities to restore or create wetlands. The Corps and the EPA jointly administer Section 404. Additional Federal agencies, including the FWS, NRCS and the National Marine Fisheries Service have advisory roles and offer technical assistance in some instances.
- **Section 401** requires that states ensure that a Section 404 permit does not violate state water quality standards.

No Net Loss Policy

“No net loss” of wetlands is a Federal policy goal that emerged in 1989, and is interpreted to mean wetlands should be conserved wherever possible, and that acres of wetlands converted to other uses must be offset through restoration and creation of other wetlands, maintaining or increasing the total wetland resource base (Heimlich, 1988).

Virginia Wetlands Protection – Avoid first, then minimize

Virginia is a leading example among states within the nation for adopting protective regulations for its wetlands. The Commonwealth of Virginia generally regulates impacts for all state waters, including wetlands, through two programs, the Virginia Water Protection Program and the Tidal Wetlands Program.

Following Section 404 requirements, Virginia emphasizes avoidance of wetlands if possible, followed by minimization of impacts.

- **Virginia Water Protection Permit (VWP) Program** – The DEQ regulates impacts to state waters, including wetlands, through the VWP for both tidal and nontidal impacts permitted under Section 404 of the Clean Water Act. This permit program also serves as Virginia’s Section 401 Certification process.

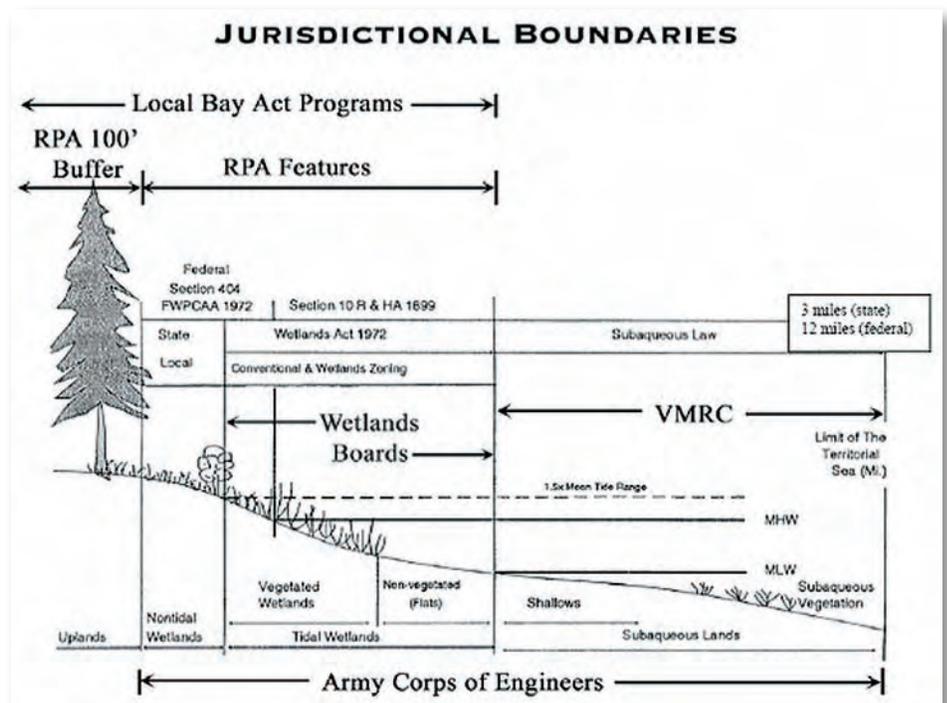


Diagram showing jurisdictional boundaries within Virginia for uplands, nontidal and tidal wetlands, and subaqueous lands. Source: Tidewater Joint Permit Application (JPA), available online at: <http://www.nao.usace.army.mil/regulatory/webTidewaterJPA2004.pdf>

Other Federal and International Regulations, Policies and Agreements that affect Virginia wetlands

- **Coastal Zone Management Act (CZMA, 16 U.S.C. §§ 1451 et. Seq.)** – Encourages state planning activities in the coastal zone and commits the Federal government to refrain from conducting or permitting activities in the coastal zone that are inconsistent with state plans. Thus, states can use the CZMA to limit wetland activities that require Federal permits.
- **National Environmental Policy Act (1969)** – Federal government agencies must prepare environmental impact statements on major and relevant Federal actions
- **Executive Order 11990 (1977)** – Federal agencies are required to take action to minimize the destruction, loss or degradation of wetlands and to preserve the natural values of wetlands on all Federal lands
- **Federal Rivers and Harbors Act, Section 10 (1899)** – Gives authority to the Corps to prohibit discharge of solids or construction into tidal and **navigable** or adjacent waters. Navigable waters are tidal or have been used or are presently being used for the transport of interstate or foreign commerce.
- **Food Securities Act (Farm Bill)** – Known as the “Swampbuster” Act, denies Federal subsidies for conversion of wetlands to agricultural uses

- **Endangered Species Act** – Protects wetlands that offer unique habitat for endangered and threatened species. Administered by the FWS

For more on Federal Wetlands Laws and Regulations go to: <http://www.epa.gov/owow/wetlands/laws/>

International Agreements

- **Ramsar Convention (1975)** – U.S. became a member in 1986. FWS responsible for implementing within the U.S. Partners are obligated to include wetland conservation into their natural resources planning process, to promote the wise use of wetlands and to designate at least one wetland for inclusion in the List of Wetlands of International Importance
- **North American Waterfowl Management Act (1986)** – Managed cooperatively by all three North American countries and sets goals for wetland conservation and waterfowl habitat
- **North American Wetlands Conservation Act** – provides matching grants to public and private entities in North America for wetlands conservation programs

(Information obtained from CBP, 1997; Firehock et al., 1998; and McCarthy, 2001.)

In 2000, the Virginia General Assembly passed the Nontidal Wetlands Act that amended Section 62.1-44.15:5 of the Code of Virginia and removed the dependence of the State Nontidal Wetlands Program on the issuance of a Federal permit to the Corps, thus enabling DEQ to use the VWP Program to regulate activities in all nontidal wetlands (DEQ, August 2005). This was extremely important for wetlands protection because in 2001, the U.S. Supreme Court issued a ruling that removed Federal protection for many isolated wetlands, including headwater wetlands. Because Virginia has a statewide wetland program independent of Federal wetland programs, DEQ regulates isolated wetlands, regardless of Federal jurisdiction. Activities such as certain types of excavation in wetlands (which may not be under Federal jurisdiction) were also added to the activities already regulated through the Section 401 Certification process (DEQ, August 2005).

- Virginia Tidal Wetlands Program**
 - The [VMRC](#) has the responsibility for issuing tidal wetlands permits under Chapters 12 and 13 of Title 28.2 of the Code of Virginia, as a result of the enactment of the Tidal Wetlands Act of 1972. Chapter 12 refers to **subaqueous** lands and Chapter 13 refers to tidal wetlands, both vegetated and nonvegetated (See the *Regulatory Definitions of Tidal Wetlands and Subaqueous Lands* Sidebar for more information). Localities in “Tidewater” have citizen-run Local Wetland Boards (LWBs), which adopt model wetland zoning ordinances for tidal wetlands. These LWBs regulate tidal wetlands. VMRC maintains oversight authority for these Wetland Boards and in areas where boards do not exist; the VMRC remains the main authority. The Virginia Institute of Marine Science (VIMS) provides scientific advice and technical assistance to both VMRC as well as the local

adapted from JLARC



Map showing location of Tidewater, Virginia. This is the location regulated by the Chesapeake Bay Preservation Act as well as localities with Local Wetland Boards

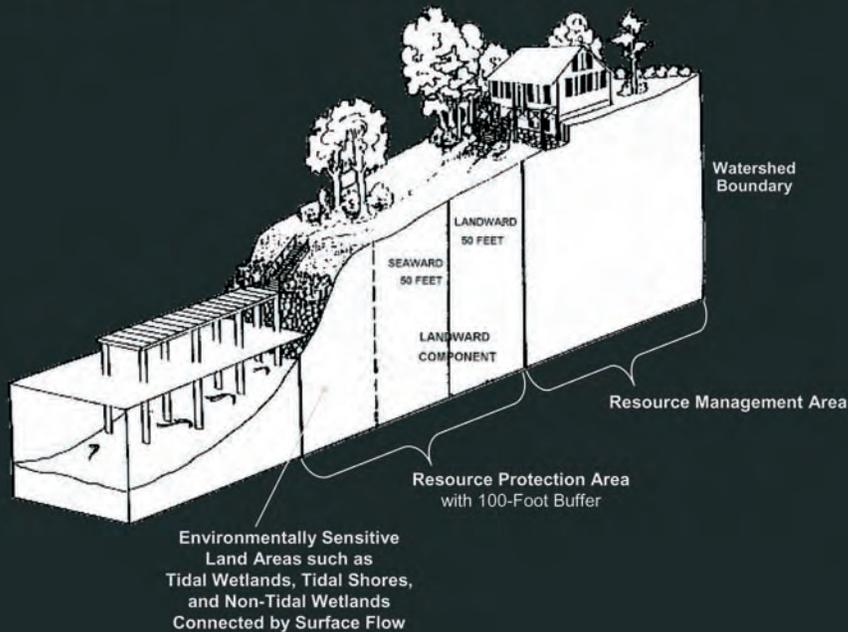
Wetland Boards. The Corps maintains a listing of contacts for these wetlands Boards at <http://www.nao.usace.army.mil/Regulatory/wetlandsboard.htm>. Only VMRC has regulatory authority for submerged aquatic lands.

Regulatory Definitions of Tidal Wetlands and Subaqueous Lands:

Tidal wetlands are tidally influenced areas within Tidewater Virginia, contiguous to mean low water extending landward to an elevation 1 1/2 times the mean tide range at a site and upon which is growing certain listed plant species. Legal tidal wetlands can also include “nonvegetated wetlands” which include unvegetated lands between mean low water and mean high water tides ([Association of State Wetland Managers, 2005](#)).

Subaqueous lands include all beds of the bays, rivers, creeks and shores of the sea that are owned by the Commonwealth. To clarify, VMRC regulates all tidal waterways as well as nontidal, perennial waterways where the upstream drainage area is 5 square miles or greater.

Chesapeake Bay Preservation Areas



Adapted from JLARC

Restoration and **Creation** are terms explained in more detail under the last part of this section, *Volunteer Efforts for “Net Gain.”* A **mitigation bank** is a wetland area that has been restored or created and then earmarked to compensate for future wetland impacts. Rather than mitigating for impacts at or near the site of development, the entity responsible for compensatory mitigation purchases “credits” as part of a mitigation bank (Firehock et al., 1998). An **in-lieu fee fund** is slightly different from a mitigation bank in that, although the developer still pays a fee for unavoidable impacts, the fee is given to a public natural resources agency or a non-governmental organization that then restores or creates wetland resources on other parcels of land (DEQ, 2005).

Compensatory Wetlands Mitigation – meeting “no net loss” goal

The Commonwealth of Virginia supports the Federal “No Net Loss” wetlands policy and is, in fact, mandated by the revised Code of Virginia pertaining to wetlands to achieve “no net loss of existing wetland acreage and function”. Additionally, Virginia is a signatory to the **2000 Chesapeake Bay Agreement**, which states that the signatories’ regulatory programs must achieve a no net loss of existing wetland acreage and function.

The VWP permit regulations require that all impacts to wetlands that cannot be avoided or minimized must be **mitigated**. Basically this means that impacted wetlands must be replaced (compensated) by both acreage as well as function. This is termed **compensatory mitigation**.

Compensatory mitigation can generally include:

- Restoration
- Creation
- Purchase or use of mitigation bank credits, or a
- Contribution to an approved in-lieu fee fund
- Preservation

Note: Preservation of wetlands alone cannot be accepted by state regulations. For more information on acceptable wetland compensation options, please refer to the Virginia Administrative Code, Title 9, Agency 25, Chapter 210 (Abbreviated 9-VAC 25-210)

More information on compensatory mitigation as part of Virginia’s Water Protection Program may be found at <http://www.deq.virginia.gov/wetlands/mitigate.html>.

More information on the Virginia Administrative Code may be found at <http://leg1.state.va.us/000/reg/TOC.HTM#T0009>

Useful Contacts and Links for Virginia Regulations:

- Virginia Department of Environmental Quality’s Wetland Program:
 - <http://www.deq.virginia.gov/wetlands/homepage.html>
- The State Water Control Law (§§ 62.1-44.15 and 62.1-44.15:5 of the Code of Virginia) can be found at:
 - <http://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+TOC6201000>
- Virginia Marine Resources Commission: <http://www.mrc.state.va.us/>
- Chesapeake Bay Local Assistance Department: <http://www.cblad.virginia.gov/>
- Virginia Coastal Program: <http://www.deq.virginia.gov/coastal/homepage.html>

Other Programs and Policies that affect Virginia Wetlands

The **Virginia Coastal Program** is part of a national coastal zone management program, a voluntary partnership between the Federal government, U.S. coastal states and territories authorized by the CZMA. To manage Virginia's coastal resources, the Virginia Coastal Program was established in 1986 and relies on a network of state agencies and local governments to administer the enforceable laws, regulations and policies that protect our coastal resources. The DEQ serves as the lead agency for Virginia's Coastal Program ([Virginia Coastal Program \[VCP\], 2005](#)).

The Chesapeake Bay Preservation Act, commonly known as "The Bay Act," was adopted by the Virginia General Assembly in 1988, and is designed to improve water quality in the Chesapeake Bay and its tidal tributaries by requiring wise resource management practices in the use and development of environmentally sensitive land features, including tidal and nontidal wetlands (CBP, 1997). The Bay Act created the Chesapeake Bay Local Assistance Department (CBLAD) to work with local governments within the "tidewater" Virginia (the same area with wetland boards). These local governments must develop their own Local Bay Act program to incorporate water quality protection into their comprehensive plans, zoning and subdivision ordinances. Each of these localities has been required to develop Chesapeake Bay Preservation Areas, including both **Resource Protection Areas** (RPAs) and **Resource Management Areas** (RMAs). RPAs are sensitive lands at or near the shoreline, which include buffer zones that include tidal and nontidal wetlands. RMAs are contiguous lands landward of the RPAs that have the potential to damage water quality (CBP, 1997 and [CBLAD, 2004](#)).

Voluntary Efforts for "Net Gain" of Wetlands in Virginia

In addition to protecting our remaining wetlands, it has become evident that further steps are necessary to enhance our wetland resources. The Commonwealth of Virginia works to achieve "no net loss" of wetlands by requiring compensatory mitigation for impacts that cannot be avoided or minimized. Concurrent to this required mitigation, the Commonwealth is actively pursuing a "net gain" of wetlands through voluntary measures to help further offset historic and impending losses. In fact, the Code of Virginia (Section 62.1-44.15:5) requires that voluntary and incentive based programs be developed to achieve a net resource gain in wetlands.

Goal - Net Gain of 10,000 Wetland Acres by 2010

The Commonwealth of Virginia has embarked on an effort to achieve a net resource gain of 10,000 acres of wetlands statewide by the year 2010 (Virginia Wetlands Restoration Coordinating Committee, 2001). The Commonwealth committed to restoring 6,000 new acres of wetlands within the Chesapeake Bay watershed by June 2010, as part of the 2000 Chesapeake Bay Agreement. In addition, Virginia set a goal to restore 4,000 acres outside of the Bay watershed. In collaboration with other Federal and state agencies and non-profit organizations, voluntary wetland restoration initiatives are under way ([DEQ, July 2005](#)).

The Success of Wetlands Net Gain "Rests on Many Shoulders"

In recent years, Federal and state government agencies as well as a number of private non-profit organizations have accomplished voluntary wetland measures on public and private lands. These groups work together and individually to restore wetlands, provide funding sources and to apply for grants. Section 4 describes this process in more detail and lists resources for technical and financial assistance and includes case studies.

Need to Think Outside of the Box – As we move into the future, the success of this wetlands goal relies more than ever on the involvement of cooperative and creative stakeholders. A stakeholder is a term for any individual or organization that has an interest in something. When referring to wetlands in the broadest sense, everyone is a stakeholder when it comes to wetlands, because they belong to all of us (Definition adapted from [Utah Department of Natural Resources \[UDNR\], 2005](#)).

Stakeholders include private or public landowners throughout the Commonwealth and can include:

- Federal agencies
- State agencies
- Local governments, including Public Works, Water quality, Natural Resources and Planning Departments
- Regional Planning District Commissions
- Soil and Water Conservation Districts
- Resource Conservation, Development Councils
- Land Trust Organizations
- K-12 schools
- Colleges & Universities
- Business Owners
- Private Citizens
- Civic Associations
- Watershed-based or other environmental organizations

Types of land that can be used for voluntary wetland measures can also vary and may include:

- Municipal Lands
- Agricultural lands
- Reclaimed surface coal mine lands
- Correctional Facilities
- Commercial developments
- Private Residences, urban, suburban and rural
- Educational Institutions
- Parks and Recreational Facilities, including wildlife management areas, refuges and natural preserves

Types of Voluntary Activities

Voluntary wetland activities are often generally referred to as “restoration” and are often used interchangeably. However, there are actually four main types of voluntary wetland activities, Preservation, Enhancement, Restoration and Creation. These terms are defined and described in Section 4 in more detail. To avoid confusion for the purposes of this Toolkit, we will refer to them as *voluntary wetland activities* when discussing them generally as a group.



Thinking outside of the Box – Voluntary Wetland Measures require creativity and cooperation