

Streams & Rivers

5 Major Rivers in the Bay Watershed
(north to south):

Susquehanna, Potomac, Rappahannock,
York, and James

Ecosystem Functions

Habitat for many species

(birds, fish, aquatic plants,
invertebrates, frogs, salamanders,
turtles, and benthic fauna such as
clams, worms, etc.)

Spawning grounds for anadromous fish

Recreation



Shallow Water

Unique habitats found at the water's edge

- ❖ Shallow waters contain a tremendous diversity of aquatic life
- ❖ These habitats are continually shifting with the tides and undergo extreme fluctuations
- ❖ Very warm in summer, cold in winter
- ❖ Storms, waves, and currents constantly move and suspend sediment
- ❖ Areas that are dry at high tide, inundated at low tide
- ❖ Storms and run off can make saline shallow areas fresh at times



Shallow Water Ecosystem Functions

- ❖ Plants provide habitat & refuge

- ❖ Shrimp, killifish, & juvenile large fish use areas as nurseries
- ❖ Shedding blue crabs use SAV beds as protection
- ❖ Predators forage for food

- ❖ Unvegetated areas are also productive

- ❖ Benthic microscopic plants cycle nutrients

- ❖ Seagrass Beds (submerged aquatic vegetation, or "SAV")

- ❖ Absorb water column nutrients
- ❖ Dispel wave energy to reduce shoreline erosion, increase particle deposition, and increase water clarity
- ❖ Produce oxygen during photosynthesis



Aquatic Reef

Solid, three-dimensional, highly structured ecological community with oysters as the dominant species

Ecosystem Functions

- ❖ Oysters have an incredible ability to filter water and consume phytoplankton, leading to increased water quality, water clarity and light penetration
 - ❖ Reefs provide habitat for other organisms, refuge from predation, feeding areas, breeding and nesting
 - ❖ Reefs enhances oyster recruitment, growth, and survival
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- ❖ Dramatic decline in oyster reefs in the last 200 years due to
 - ❖ Pollution
 - ❖ Disease
 - ❖ Historical harvesting pressure
 - ❖ Silting



Open Water

Areas beyond the depth of approximately 6 feet

- ❖ Home to benthic communities, pelagic animals, and plants (phytoplankton)
- ❖ Not enough light penetrates to the bottom for **SAV (submerged aquatic vegetation)**
- ❖ Many areas of open water have thriving communities of pelagic fishes and invertebrates



Want to build a marina, grow some oysters, or put rocks on your eroding beach? Shoreline activity requires a permit!

Virginia's shoreline permitting process is regulated by 3 laws.

Virginia Marine Resources Commission (VMRC) is the regulating authority.

1. The Code of Virginia vests ownership of "all the beds of the bays, rivers, creeks, and shores of the sea in the Commonwealth to be used as a common by all the people of Virginia." Permits are required from the Marine Resources Commission to encroach upon or over State-owned bottomlands.
2. Virginia Wetlands Act - 1972
Chapter 13 of Title 28.2 Code of Virginia regulates the use and development of tidal wetlands
3. Coastal Primary Sand Dunes/ Beaches Act - 1980
Chapter 14 of Title 28.2 Code of Virginia



Wetlands Guidelines

VIMS and the Virginia Marine Resources Commission have developed guidelines for activities involving wetlands.

You can learn more about wetlands regulations from:

VIMS

<http://ccrm.vims.edu/index.html>

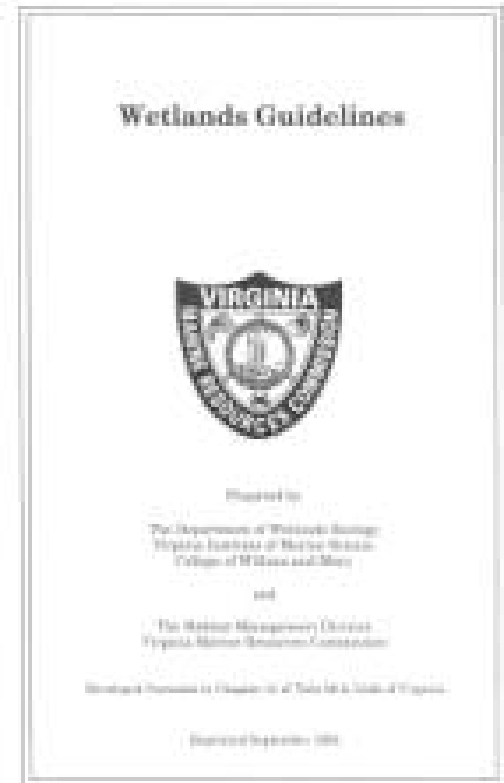
VMRC

www.mrc.virginia.gov/hmac/hmoverview.shtm

VA Dept of Environmental Quality

www.deq.virginia.gov/wetlands/

Federal Legislation and Regulations include
[Clean Water Act](#) and Rivers and Harbors Act
(Army Corps of Engineers regulates)



Thanks for listening!



Quick Quiz!

Name at least 3 important “ecosystem functions” of an estuary.

