

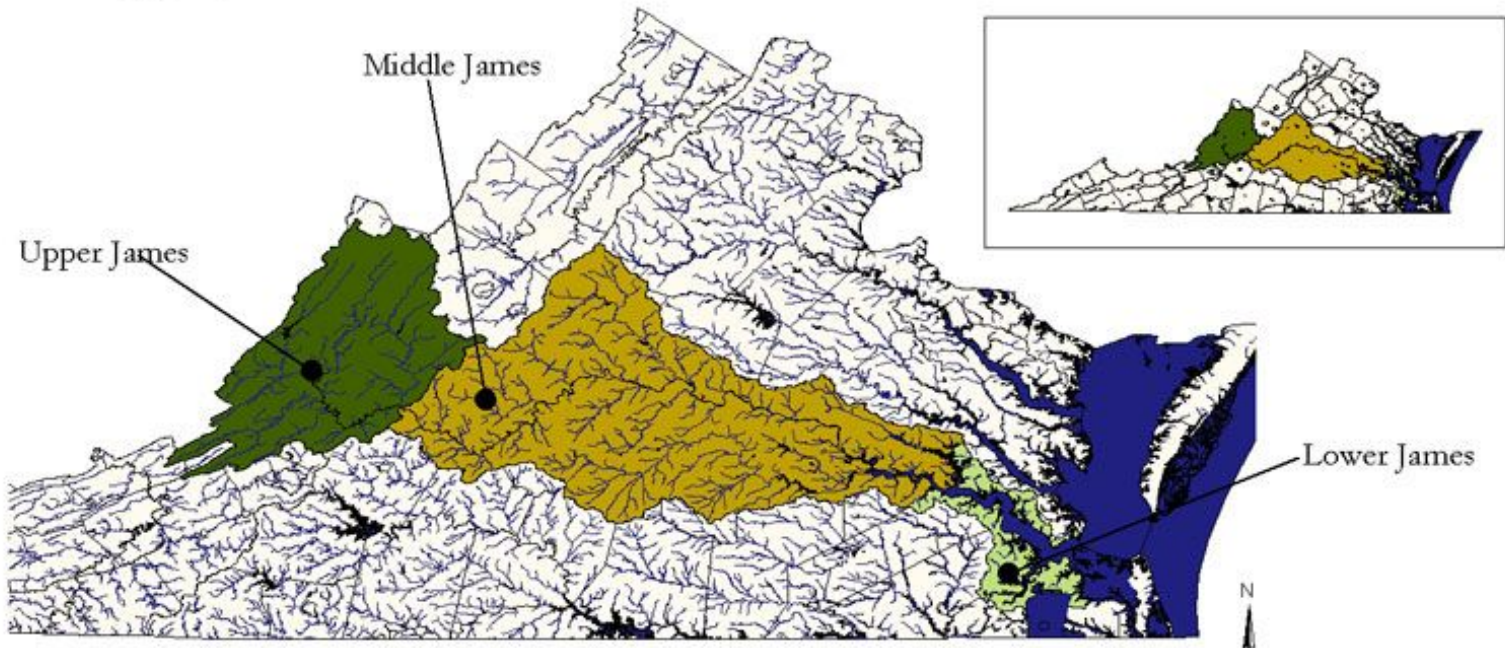


James River Action Plan (J-RAP)

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James River Watershed

Upper, Middle and Lower Roundtable Watershed Boundaries





Background

- Located in Virginia, begins at the headwaters of the Cowpasture and Jackson Rivers in Bath and Highland Counties and empties into the Chesapeake Bay
- The James River Watershed is over 10,000 square miles in size
- Comprises of three sections: Upper, Middle, and Lower James
- This watershed is home to about 3 million people
- It encompasses 15,000 miles of tributaries including the Appomattox River, Chickahominy River, Cowpasture River, Hardware River, Jackson River, Maury River, Rivanna River, and Tye River
- The James River is the largest tributary to the Chesapeake Bay



History

- The first inhabitants along the James water were nomadic hunters-gatherers starting at least 15,000 years ago.
- Their nomadic movement, along with reasonable population, produced less stress on the Basin from human activities.
- Starting around 3000 years ago, the tribes began to settle and have more agricultural practices
- Generally, the Powhatan (formerly the name of this river) were located below the fall line, and west of the fall line the Monacan tribe ruled most of central Virginia.
- That is until European settlement in Jamestown shifted the power and the quality of the watershed



History

- In 1607, the Jamestown settlement was found by European explorers
- The settlers did not have proper systems set up for their waste causing the water they drank to be contaminated with harmful pathogens
- Also, reports today indicate that there were harmful amounts of Arsenic in the water they drank
- These water quality issues diminished the colony to a mere 500 members before help from England arrived.



Mission Statement

- J-RAP's mission is to attain sufficient water quality standards for wildlife and recreation in the James River Basin of southern Virginia by the year 2030.

The James River Association: What is it and what do they do

- The James River Association acts as a voice for the river and take action to promote conservation of its natural resources.
 - Core programs include advocacy, education, community conservation, the James Riverkeeper program, and watershed restoration.
 - Goals this association has is to help communities realize the benefits of a healthy James River and support the protection of it.
 - Overall vision is to see the James River be restored to an A rating in the state of James report.



The James River Association: Current Projects



- Increasing the adoption of Low Impact Development (LID) requirements throughout the watershed. Each of the localities in Virginia were ranked on 76 LID principles
- Provide cost-effective solutions for meeting stormwater pollution obligations outlined in the Chesapeake Bay Cleanup.
- Project to see how localities could simultaneously meet their Chesapeake Bay and local cleanup goals.



Policies and Mandates in Place

- As of right now the James River Watershed has policies on
 - National Wildlife Refuge System Mission, Goals, and Purposes
 - The National Wildlife Refuge System
 - Maintaining Biological Integrity, Diversity, and Environmental Health
 - Appropriateness of Refuge Uses
 - Coordination and Cooperative Work with State Fish and Wildlife Agencies
 - Wildlife-dependent Refuge Uses
 - The Archaeological Resources Protection Act



Problem 1: Harmful Algae Blooms

- The largest contributors to algae blooms in the James river are agricultural sources such as manure, pesticides, and fertilizers. Stormwater runoff carries these into the Chesapeake Bay watershed, contributing to massive algae blooms.
- Agriculture is the largest private industry in the state of Virginia, supplying over 300,000 jobs and bringing in roughly \$70 billion each year. Farmland covers 32% of Virginia's total land, with many farms bordering the James river watershed. Fertilizers and pesticides are vital to the agricultural industry but can be detrimental to river habitat and wildlife populations. When nutrient levels in the water are high, this causes algae to grow at a tremendous rate, during which time it may also produce harmful toxins.
- Toxic and even non-toxic algae blooms deplete oxygen in the water killing fish populations and making water treatment much more difficult and expensive. The Virginia government estimates pollution reduction could cost up to \$2 billion or more. Nutrient concentrations must decrease if we hope to reach liveable standards.





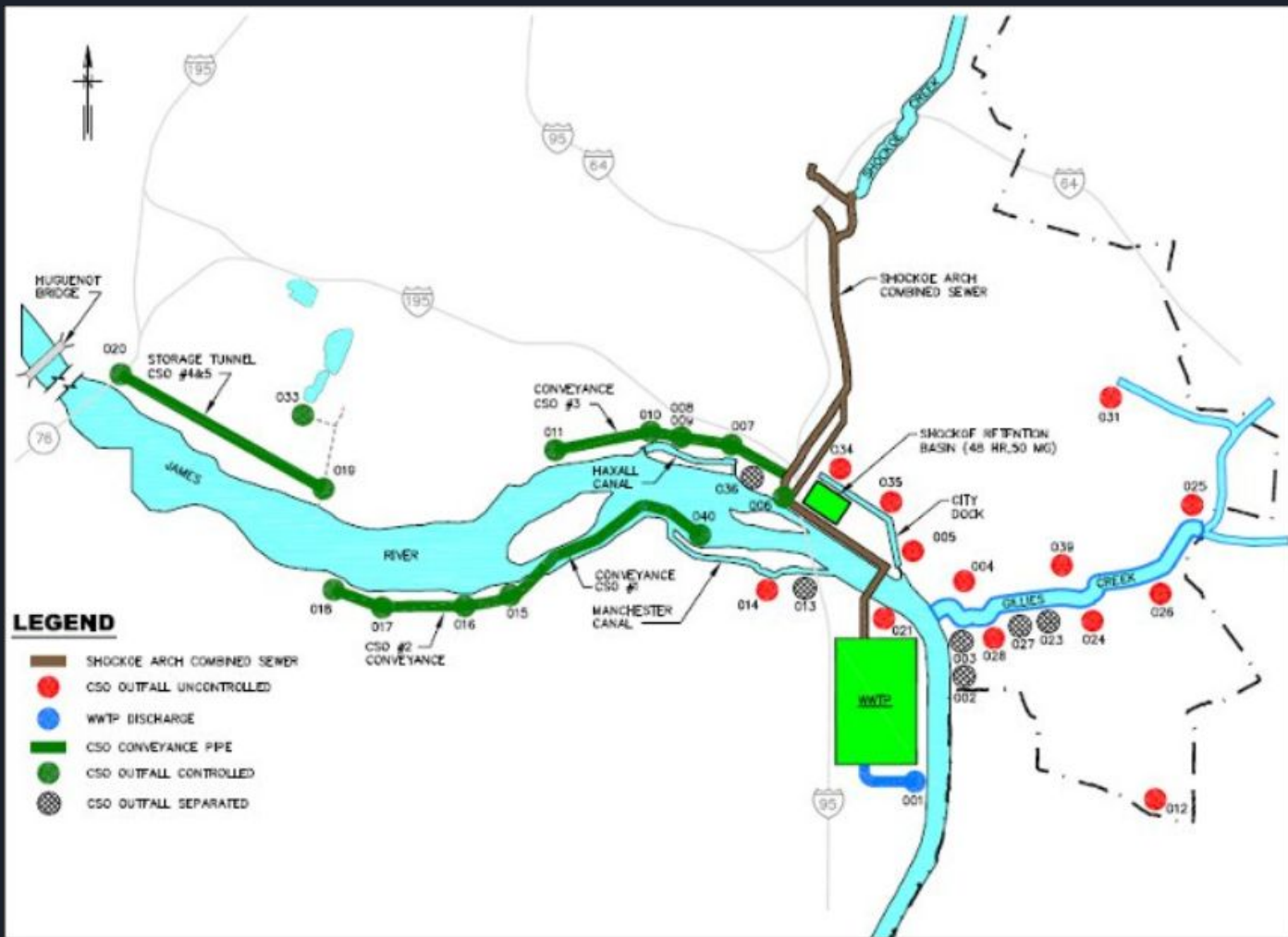
Goal 1: Reduce algae growth by limiting amount of polluted runoff

- More consistent soil and groundwater well tests to determine nutrient and manure concentration
- Reduce pesticide and fertilizer use in areas at risk for runoff
- Protect vegetation around streams and riverbanks



Problem 2: High Bacteria Levels

- Runoff from storms take manure from animals into nearby streams and rivers.
- The maintenance of Virginia's sewer system has become a water quality issue for the James River Basin, as outflows from storms spill untreated water into the river.
- The result is high bacteria levels in the James River.





Goal 2: High Bacteria Levels

- J-RAP plans on implementing new fencing around the watershed to keep livestock away from bodies of water
- J-RAP plans on working with Richmond on massive storage systems that will capture the surges from the sewage systems.



Problem 3: Habitat Degradation

- Problem overview: Underwater grasses which provide habitat and improve water quality in the James River fluctuate dramatically in population size from year to year and are still absent in a large portion of the river
- Caused by: Pollution runoff, sediment, overfishing of keystone species, invasive species, urbanization
- Results in a decrease in biodiversity:
 - Oysters and brook trout continue to struggle at low levels
 - Rock fish and smallmouth bass, usually at healthy numbers, declined over the past 2 years



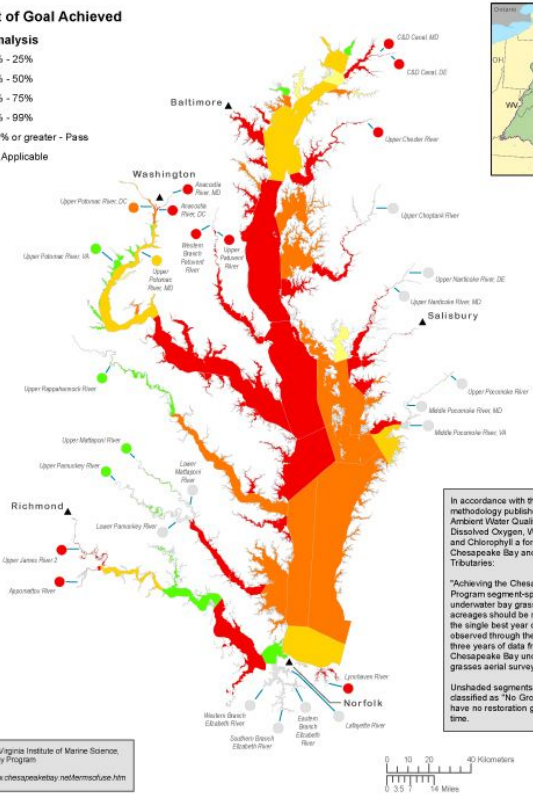
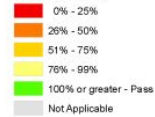
Bay Grasses (SAV) Restoration Goal Achievement

Single Best Year 2011 - 2013



Percent of Goal Achieved

3-year Analysis

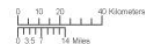


In accordance with the methodology published in Ambient Water Quality Criteria for Dissolved Oxygen, Water Clarity and Chlorophyll a for the Chesapeake Bay and its Tidal Tributaries:

"Achieving the Chesapeake Bay Program segment-specific underwater bay grass restoration acreages should be measured as the single best year of acreage as observed through the most recent three years of data from the Chesapeake Bay underwater bay grasses aerial survey."

Unshaded segments are classified as "No Grow Zones" or have no restoration goal at this time.

Data Sources: Virginia Institute of Marine Science, Chesapeake Bay Program
 Disclaimer: www.chesapeakebay.net/farmscience.htm





Goal 3: Maintain and Restore Biodiversity and Ecosystem Health by Rehabilitating Underwater Grass Populations

- Grasses benefit the ecosystem:
 - The underwater grasses provide essential habitat and food for young fish, crabs and waterfowl; therefore allowing greater biodiversity.
 - These grasses also help the ecosystem by pumping oxygen into the water, trapping sediments, and absorbing wave energy
- To restore grasses:
 - Reduce pollution from both nutrients and sediments to improve water clarity. Sediment and algae that feed on excess nutrients in the water prevent sunlight from reaching the grasses on the bottom.
 - Improve species diversity of the grasses themselves. Certain grass species grow better in different conditions



Conclusion and Recommendations

Reduce harmful algae blooms by significantly reducing the concentration of algae and chlorophyll in the river basin.

Reduce E.coli and other bacteria concentrations by controlling sewage overflow into the James river at certain overflow points.

Reduce sediment and nutrient pollution and monitor grass species diversity to allow for steady growth, therefore, restoring a balance to the ecosystem by providing habitat, food, oxygen, and sediment control.