FFY14

Richmond Regional PDC Technical Assistance FINAL REPORT

Grant Number: NA14NOS4190141

Task Number: 48

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Virginia Coastal Zone MANAGEMENT PROGRAM

Richmond Regional Planning District Commission

Planning district commissions make government more efficient and effective through coordinated planning and program analysis. Virginia's General Assembly created planning districts in 1968 under the authority of the *Virginia Area Development Act*-revised as the *Regional Cooperation Act* in 1995- "to promote orderly and efficient development of the physical, social and economic elements of the districts." Through planning district commissions, now 21 in number, local governments solve mutual problems which cross boundary lines and obtain expertise from professional staff and advice on making the most of scarce taxpayer dollars through intergovernmental cooperation.

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Appendix C: Regional Existing Land Use Findings

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Executive Summary

Technical Assistance

RRPDC staff processed 46 environmental reviews and 32 intergovernmental reviews.

Coordination and Training

On October 2, 2014, RRPDC staff organized an Environmental TAC meeting at the Charles City County Government Building. Locality staffs and Soil and Water Conservation District staffs were in attendance. DEQ staff provided a presentation on the revived efforts at Chesapeake Bay Preservation Act compliance reviews. A roundtable discussion on the topic of locality and SWCD coordination followed the presentation by DEQ staff.

On October 30, 2014, RRPDC staff hosted the Virginia Outdoors Plan Richmond Regional Meeting. DCR staff presented the 2013 Virginia Outdoors Plan and web mapper. Feedback was also sought from local planners, recreation professionals and other stakeholders regarding data accuracy and updates for the Plan and web mapper.

On January 8, 2015 RRPDC staff hosted an information session for Board members and locality staffs on the subject of biosolids and industrial residuals production, land application, science, legislation and permitting. Presenters included Henrico County Utilities staff, Virginia Tech soil science staff, DEQ staff, and House of Delegates Representative Chris Peace.

On May 7, 2015, RRPDC staff hosted an Environmental TAC meeting. Chesterfield County staff provided a presentation of the County's IDDE Traveling Car Wash Kit. The kit is free to county residents who plan to hold a car wash to benefit a non-profit or community or school group, such as a girl scout troop or soccer team. The kit prevents the wash waste water from illegally entering the County's MS4 system. Timmons and City of Richmond staff led a discussion about future opportunities of a regional Army Corps permit in the Richmond Region. City of Richmond staff provided a presentation on the Integrated Permit Planning Process currently underway, RVA H2O. The meeting concluded with a round robin discussion around the table of current and future projects and issues.

Regional Existing Land Use Trends Analysis

RRPDC staff has completed the second iteration of the regional existing land use inventory**.** The Existing Land Use Inventory was first completed in 2009; this iteration updated to data using 2013 aerial imagery. Preliminary data findings and analysis are included in this Report.

Green Infrastructure Base Map Update

RRPDC staff used building/structure data (locally and regionally sourced) updated to the 2013 VGIN aerial imagery to "update" the DCR-NH Virginia Natural Landscape Assessment ecological core data. The last update of this data was performed in 2008/9 by RRPDC staff making the original dataset, current as of 2000, updated to 2007.

Local Implementation Advocacy

RRPDC staff provided technical expertise and guidance to Groundwork RVA, a fledgling non-profit focused on transforming liabilities in Richmond's urban communities into assets. RRPDC staff served as Board Chair, working with Groundwork staff and board members to select

projects which have a positive impact on environmental and water quality. Projects incorporate environmental education, training and outdoor experiences to high school students. Projects include the Cannon Creek Greenway trail maintenance and outdoor classroom, an urban farm at Armstrong High School, the Eastview Trail, and the 25th Street pocket park all on formerly vacant land.

Benefits Accrued from Past CZM Grants

RRPDC staff has cataloged items for this report. A final report is included in this grant Final Report.

Product #1: Technical Assistance

Throughout the grant year, RRPDC staff provided Technical Assistance to locality staffs. RRPDC staff processed 78 environmental and intergovernmental reviews during FFY14. These reviews include, but are not limited to groundwater withdrawal permits, environmental impact reports, federal coastal consistency certifications, Virginia water protection permits, Virginia pollution abatement permits, etc.

Once these reviews are received, RRPDC staff communicates with local staffs about comments or concerns they may have. PDC staff performs any further research or analysis necessary to fully understand the regional impacts of proposed actions in question. RRPDC staff prepares and submits an appropriate comment letter for the proposed project or permit.

A complete listing of all environmental and intergovernmental reviews processed by RRPDC staff is included in Appendix A.

Product #2: Coordination & Training

RRPDC Staff hosted four coordination and training regional meetings throughout FFY14. Agendas and meeting materials from these meetings are included in Appendix B.

On October 2, 2014, RRPDC staff organized a Richmond Regional Water Quality Roundtable/ Environmental TAC meeting at the Charles City County Government Building. Locality staffs and Soil and Water Conservation District staffs were in attendance. DEQ staff provided a presentation on the revived efforts at Chesapeake Bay Preservation Act compliance reviews. A roundtable discussion on the topic of locality and SWCD coordination followed the presentation by DEQ staff.

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RRPDC staff are members of the James River Advisory Council (JRAC) attending regular meetings throughout the year. Information gathered at these meetings is always shared with local staffs. For more information about JRAC see www.jamesriveradvisorycouncil.org .

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RRPDC staff are members of the Middle James Roundtable (MJRT) Steering Committee. The Steering Committee has regular quarterly meetings throughout the year, one of which is the annual meeting for planners and other professional from all over the middle James River watershed. As with JRAC, RRPDC staff shares information gathered at MJRT steering

committee meeting with local planning staff. For more information about the MJRT see http://www.mjrt.org/ .

Product #3: Regional Existing Land Use Trends Analysis

The regional existing land use datasets are useful for regional and local planners to use when comparing land use change over time across locality boundaries. The dataset can be used for planning and analyses for a variety of purposes including water quality, transportation, recreation, and economic development.

To update the regional existing land use inventory conducted in 2009, RRPDC staff compared each parcel across the region to the aerial photography flown by the Virginia Geographic Information Network (VGIN) in December of 2013. Since the 2009 existing land use dataset was an amalgamation of various datasets from each jurisdiction, comparing that dataset to new aerials was determined to be the most accurate method of creating a newer and even more accurate dataset.

There were actually two simultaneous datasets created in FFY 2014: a correction of the 2009 dataset and any actual changes in land use. Because the FFY 2014 work marked the first time each individual parcel was looked at, there was an opportunity to correct not only any mistakes made by RRPDC staff in the previous dataset, but also any inaccuracies which would have been in the original locality datasets. In order to compare "apples to apples", a corrected version of the original dataset had to be created.

Detailed descriptions of the land use categories as well as a summary chart and map of the updated existing land use data is included in Appendix C.

Product #4: Green Infrastructure Base Map Update

In FFY14, RRPDC staff updated the Richmond Region Ecological Forest Core GIS layer. A state-wide ecological forest core layer, named the Virginia Natural Landscape Assessment, was initially created by Virginia Department of Conservation and Recreation Division of Natural Heritage (DCR-NH) staff in 2007 based on year 2000 aerial imagery and various GIS datasets. In 2009, RRPDC staff completed an update of this ecological core layer for the Richmond Region using local structure/building data. The base year for this update was 2007 using aerial imagery available from VGIN. RRPDC staff completed the current update using locally available building/structure data and gap filling using aerial imagery available from VGIN from 2013. Core areas were updated to reflect loss due to development and cores were rescored based on area change. With the completion of this last update, there are 3 iterations of the ecological forest core GIS layer: the first based on 2000, the second updated to 2007, and the third updated to 2013.

An analysis of the ecological forest core data reveals that the rate of loss of core integrity (score) and area was greatest during the economic peak time between 2000 and 2007. The economic recession in 2008 drastically slowed core loss as development came to a near standstill. Indeed, the annual rate of core loss from 2000 – 2007 was 14,715 acres per year in the Richmond Region. From 2007 – 2013, the rate of loss was more than 10,000 acres per year less: 4,421 acres per year. Nonetheless, ecological cores continued to degrade. By 2013, cores identified as requiring further analysis due to their amount of change relative to their starting acreage accounted for 20% for total core area in the Richmond Region and 60% of all remaining cores.

In FFY 2015 RRPDC staff intend to do further analysis with the updated ecological forest core layer. An analysis using the regional existing land use dataset will provide insight into the impact of various land uses on forest core loss, i.e. what land uses account for forest core loss? Paring such analysis with the RRPDC Socioeconomic Data population and housing projections will provide valuable insight into area vulnerable to forest loss. In areas forest areas likely to see development in the near future, site design can play a crucial role in mitigating forest core loss due to development. Knowledge of those land uses most responsible for forest loss will allow planners to focus site design education and policy efforts to those land use s that pose the greatest risk for forest loss.

A full report of the findings, including ecological forest core and green infrastructure theme maps, is included in Appendix D.

Product #5: Local Implementation Advocacy

RRPDC staff provided technical expertise and guidance to GroundworkRVA, a fledgling non-profit focused on transforming liabilities in Richmond's urban communities into assets. Projects during FFY14 included the Eastview trail, a new urban farm at Armstrong High School, and the 25th Street pocket park, all on formerly vacant land. Projects incorporated environmental education, training and outdoor experiences to high school students in underserved Richmond neighborhoods.

RRPDC staff works with Groundwork RVA staff and board to select projects which have a high probability of being executed and have a positive impact on environmental and water quality.

Pictures of the above mentioned projects are included in Appendix E.

Product #6: Regional Existing Land Use GIS Dataset

Benefits accrued this year include:

- The Richmond Region existing land use dataset contributing to and framing the discussion around what elements should be included in the Richmond Region Indicators Project. The Indicators project has been undertaken by the Capital Region Collaborative, a joint venture between the RRPDC and the Greater Richmond Chamber of Commerce. Both a printed report and an interactive website are in development for the Indicators project.
- The MeadWestvaco Foundation paid for an update to and additional printing of the *Rivers of the Richmond Region: A Public Access Guide* in March of 2015. The *Guide* was originally paid for and printed using VCZM Program grant funds.

APPENDIX A

October 2014	Higgerson Buchanan Ground Water Withdrawal Permit GW00320900
	Rural Point Subdivision Groundwater withdrawal permit GW0003001
	Replace Airfield Signage, Richmond International Airport Consistency Certification
	Virginia Water Protection Permit: Port Tobacco at Weanack
	VCU: Virginia Treatment Center for Children
	VPDES Permit No. VA0024899 Reissuance: Ashland WWTP
	East-West Hallsley, LLC VWP Permit No. 04-1215 Modification
	VWP No. 13-0688 The East End Landfill Expansion, Henrico County , VA
November 2014	VPDES Permit No. VA0063037 Reissuance: Blessed Sacrament -Huguenot Academy
	Meadowville Technology Park VWP Permit # 13-1389
	Meadowville Technology Parkway Extension
December 2014	Virginia Community College System: Phase III Academic Building & Parking Deck, John Tyler CC
	Ashland Residency Office Building
	Notice for Early Public Review of a Proposal to Support Activity a Wetland.
	Airport Improvement Projects at Richmond International Airport
January 2015	VDH FY14 Drinking Water State Revolving Fund Program Safe Drinking Water Act
	VPDES Permit Reissuance: Grange Hall Elementary School
	[14-05] NOAA 309- Wetlands-Managing and Adapting Coastal Habitats to Preserve Ecological Services with Increasing Sea Level and Development Pressure
	[14-06] NOAA 309- Ocean Planning: Documenting Endangered Migratory Species for Offshore Energy Planning
	[14-07] NOAA Habitat Conservation Program- Marine Debris Grant
	Capital Area Partnership (CAPUP) FTA Section 5310 program request to purchase transportation equipment
	VPA Permit No. VPA00584 Synagro Central LLC
	Town of West Point Ground Water Withdrawal Permit # GW0005001
	Temporary Storage of Wheeled Tactical Vehicles at Defense Supply Center, Richmond

February 2015	I-95/Lewistown Road Interchange Project, Hanover County Municipal Airport Consistency Certification
	Sliding Hill/Air Park Road Intersection Project--Hanover County Municipal Airport Consistency Certification
	VPDES Permit No. VA0058378 Reissuance--Kinder Morgan Southeast Terminals
	Heart Havens, Inc. FTA Section 5310 program request to purchase transportation equipment
	Chesterfield Community Services Board FTA Section 5310 program request to purchase transportation equipment
	Demolition of Buildings 10, 11, and 67 at Defense Supply Center, Richmond
	Aqua Virginia, Inc. for Woodruff Subdivision GWWP GW0002001
	The Greater Richmond ARC (Association for Retarded Citizens) FTA Section 5310 program request to purchase transportation equipment
	East Side Clearing and Building Demolition, Richmond International Airport Consistency Certification
	VCU 706-716 West Grace Street Acquisition
	VWP No. 13-0873 Mountain Run Phase 5
	VPDES Permit No. VA0080233 Hideaway Sewage Treatment Plant;
	VPDES Permit No. Va0060585 Public Administration Sewage Treatment Plant
March 2015	The Studios at Richmond Consistency Determination
	VPDES Permit No. VA0005720 Reissuance: Motiva Enterprises LLC, Richmond Terminal
	Kroger at Greenyard Road Consistency Certification
	VPDES Permit No. VA0052906 Reissuance: Doswell Truck Stop
	Springfield Road Property Consistency Determination
	VPDES Permit No. VA0062731 Reissuance: Elk Hill Farm Wastewater Treatment Plant
April 2015	Nestle Purina PetCare Ground Water Withdrawal Permit # GW0003501
	Atlee Road Extension Project Consistency Certification
	VCU Basketball Practice Facility 1300, 1328 W. Marshall Street
	Abberly at Centerpointe Apartments Consistency Determination
	VPDES Permit No. VA0080390: Sussex Service Authority:
	VWPP 13-1611: Middle James River Federal Navigational Channel

May 2015	[14-09] – FY2014 Section 319(h) Nonpoint Source Implementation Grant application
	[14-10] FY15 Chesapeake Bay Monitoring Program (CWA 117(e)(1)(B)
	Renovate Building B (Georgiadis Hall), JSRCC Parham Road
	VPDES Permit No. VA0004146 Reissuance Dominion Chesterfield Power Station
	Powhatan State Park- Complete Phase I Development
	VCU: 616 West Grace Street
June 2015	[14-11] VADEQ 2015-2017 Wetlands Protection Application
	Virginia Department of Agriculture and Consumer Services Pesticide Performance Partnership Grant Application FY15-17
	VPDES Permit # VA0024163 Reissuance: Mary Mother of the Church Abbey Sewage Treatment Plant
	[14-12] 29th Year VA VZM Implementation Application
	The Hall Property Multi-Use Development Consistency Certification
	Princess Anne Country Club Ground Water Withdrawal Permit
	[14-13] FY2014 VADEQ Technical Review and Services for Defense Environmental Restoration Program (DERP) Activities at Active DoD Facilities and Environmental Restoration at Base Closure Sites
	Composting for Community: A program to expand small-scale, community-based composting in the Mid-Atlantic
	Modification VWP# 13-0121 Capital Trail-New Market Section, Henrico county
	[14-14] Virginia DEQ Diesel Emissions Reduction Assistance (DERA3) Project
	Re-issuance of VPDES Permit No. VA0026557– Philip Morris USA Inc. – Park 500

July 2015	[14-14] Sec 103 for National Air Toxics Trends Station (NATTS) Air Monitoring Site Program
	[14-15] Chesapeake Bay Nonpoint Source Implementation Grant
	Taxiway Rehabilitation & Lighting Installation, New Kent County Airport
	The Bliley Apartments Consistency Determination
	Paramount Kings Dominion Camp Wilderness Expansion Consistency Certification
	Army 2020 Force Structure Realignment Environmental Assessment
	[15-01] L A Clarke RA OU 4
August 2015	Tomahawk Creek Project Consistency Certification
	VPDES Permit Reissuance # VA0020702 Virginia Correctional Center for Women
	[15-03] FY2014 State revolving Loan Funds Capitalization Application
	PSD Permit: James River Genco, LLC
	VPDES Permit Reissuance # VA0054330 --Slurry Pavers, Inc.
	[15-04] FY2015-FY2018 Performance Partnership Grant Application
September 2015	[15-05] FY2014-FY2016 Collaborative Fisheries Planning for Virginia's Offshore Wind Grant Application
	[15-02] – L A Clarke RA OU 3
	VPA Permit # VPA00800: Recyc systems, Inc.
	VPA Permit # VPA00832: Nutri-Blend, Inc.
	Spring Arbor Cottage of Salisbury, Memory Care Facility Consistency Determination
	Cunningham-Elmont 500 kV Transmission Line Rebuild, Va. Electric & Power Co. PUE 2014-00047
	EPA Funding Application National Clean Diesel Funding Assistance Program (VPA-OAR-OTAQ-14-05)
	VPA Permit # VPA00840: Nutri-Blend, Inc.
	RIC East Side Roadway/Utility Extension Consistency Certification

APPENDIX B

AGENDA

Water Quality Roundtable Meeting

October 2, 2014

Charles City County Government Complex
Auditorium
10900 Courthouse Road
Charles City, VA 23030

CALL TO ORDER ……..……1:30 P.M.

1:30 Welcome & Introductions

1:40 Coastal Zone Management Program Update

- Potterfield Dam Walk South Bank Habitat Restoration and Native Plant Demonstration Project (PDC Competitive Projects)
- Coastal Partners Workshop – December 10-11, 2014
- State Wildlife Action Plan Update
- Virginia Offshore Oil and Gas Readiness Study
- Federal Consistency and Protection of State-Listed Threatened and Endangered Species
- Update & Printing of *Rivers of the Richmond Region* Brochure

2:00 Chesapeake Bay Preservation Act Compliance Review Update – Shawn Smith, DEQ

2:30 Locality – SWCD Discussion

- How is your locality and SWCD working together?
- What challenges do you face?
- Need to formalize cooperation agreements/arrangements?
- Best practices?

3:30 Adjourn

Thank you for attending
the annual regional meeting to discuss…

The Virginia Outdoors Plan

October 30, 2014
9:30am to 12 noon

Richmond Regional Planning District Commission
9211 Forest Hill Avenue, Suite 200
Richmond, VA 23235

Agenda

Introduction of the Virginia Outdoors Plan (VOP)

- Virginia's First Lady video
- PowerPoint of final VOP
- Online document

Presentation on Online Mapper

Regional Chapter Overview

Use of VOP

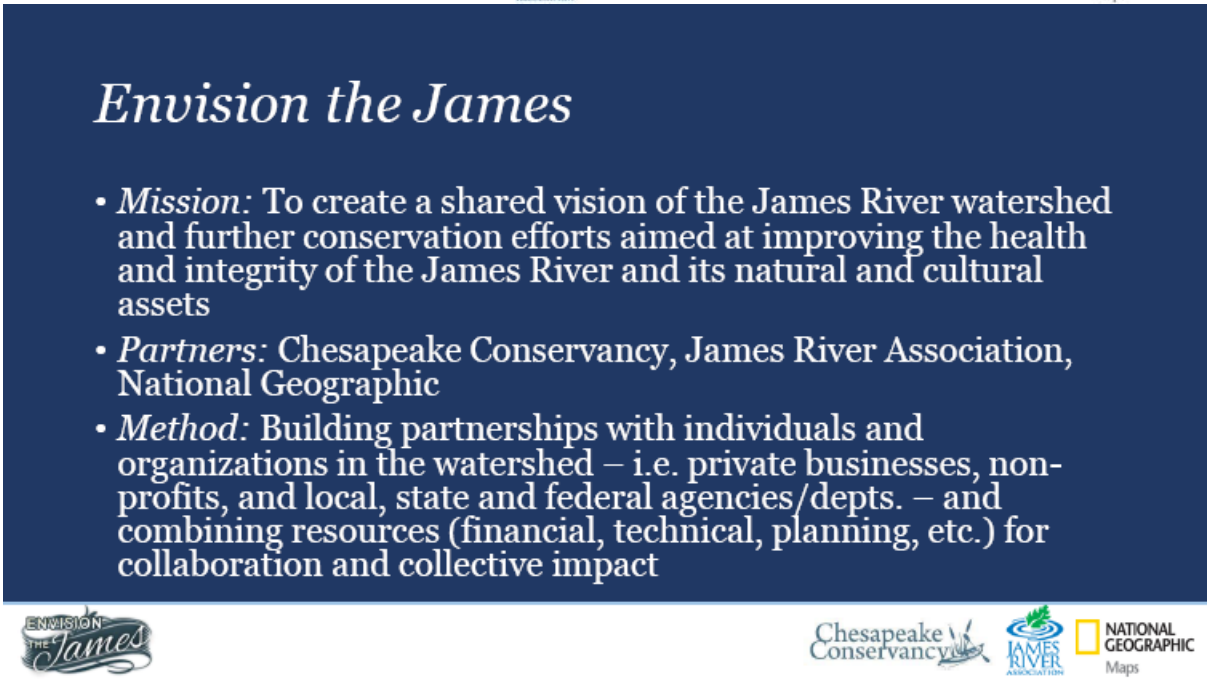
- Ways Localities are Using the VOP
- Identify regional accomplishments and featured projects
- Regional updates/ additions

Coordinate Annual Map Updates.
Contact Robbie Rhur, Environmental Program Planner
(Robbie.rhur@dcr.virginia.gov)

Additional DCR assistance

For VOP Follow-up, please contact:
Bill Conkle, Park Planner
Bill.conkle@dcr.virginia.gov
804-786-5492


ENVISION THE James
Envision the James
Chesapeake Conservancy
JAMES RIVER ASSOCIATION
NATIONAL GEOGRAPHIC Maps


Envision the James
• Mission: To create a shared vision of the James River watershed and further conservation efforts aimed at improving the health and integrity of the James River and its natural and cultural assets
• Partners: Chesapeake Conservancy, James River Association, National Geographic
• Method: Building partnerships with individuals and organizations in the watershed – i.e. private businesses, non-profits, and local, state and federal agencies/depts. – and combining resources (financial, technical, planning, etc.) for collaboration and collective impact
ENVISION THE James
Chesapeake Conservancy
JAMES RIVER ASSOCIATION
NATIONAL GEOGRAPHIC Maps

Wildlife & Landscape Conservation Initiative

Goal:

Water quality and wildlife habitat enhancement:

- Habitat restoration projects
- Land conservation in watershed and along riparian corridors

Protection of important cultural, historical, and natural landscapes

Envision the James | Chesapeake Conservancy | James River Association | National Geographic Maps

Wildlife & Landscape Conservation Initiative

Objectives:

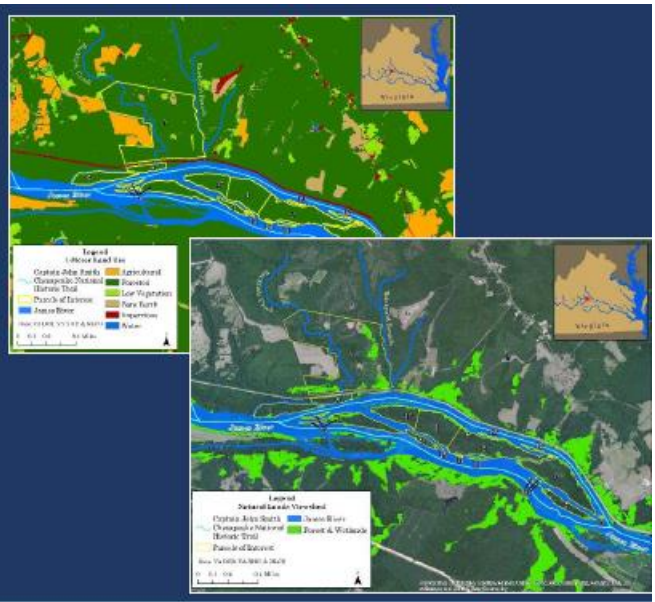
1. **Land Conservation**
   a) Protect evocative stream segments and important open spaces
   b) Acquire/ease property of high ecological, cultural, and /or historic value
2. **Riparian Buffer Restoration**
   a) Restore buffers and enhance wildlife habitat
3. **Wildlife Habitat Enhancement**
   a) Encourage wildlife management on public and private lands

Envision the James | Chesapeake Conservancy | James River Association | National Geographic Maps

Land Conservation

Forest Legacy Program

- Submitted proposal for 360-acre property in Fluvanna Co., VA, in conjunction with the James River Association (JRA)



ENVISION THE James

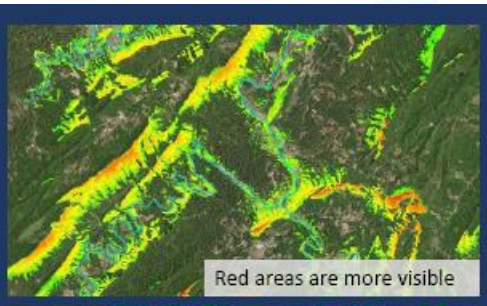
Chesapeake Conservancy | JAMES RIVER ASSOCIATION | NATIONAL GEOGRAPHIC Maps

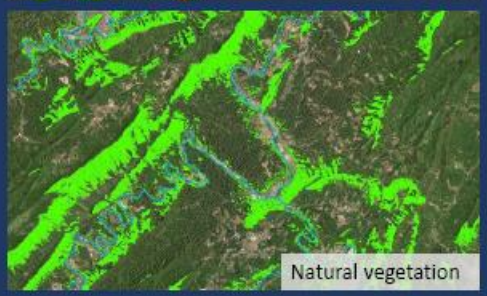
Land Conservation

Viewshed Analysis

- Performed and updated visibility analysis along entire river to provide an analysis of lands/areas visible from James River
- Update ensured consistency with existing NPS products

Available at:
http://www.chesapeakeconservancy.org/images/TripsandTips/James/default.htm





ENVISION THE James

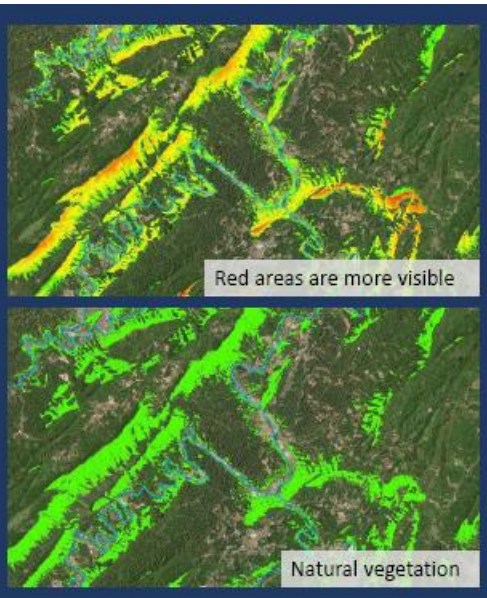
Chesapeake Conservancy | JAMES RIVER ASSOCIATION | NATIONAL GEOGRAPHIC Maps

Land Conservation

Viewshed Analysis

NEXT: What ecological, cultural, and historic values are in each visible parcel?

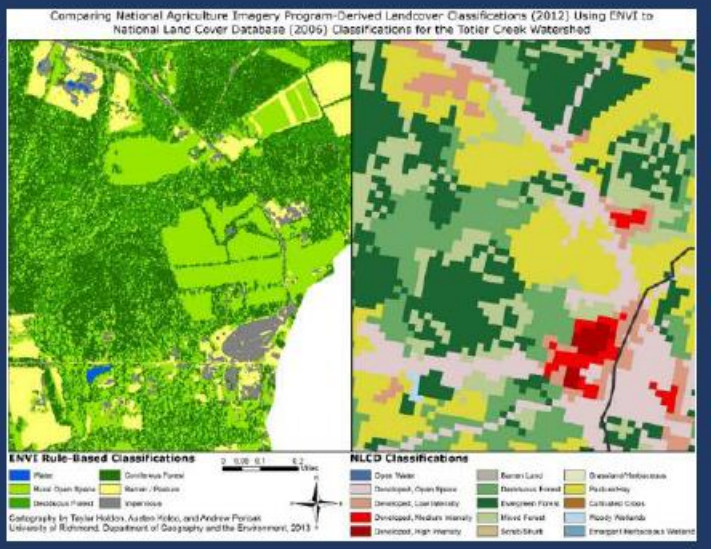
- Adding additional priority layers from State Agencies



Land Conservation

High Resolution Landscape Analysis

NEXT: Anticipated completion of Nov. 2014; make data available to partners

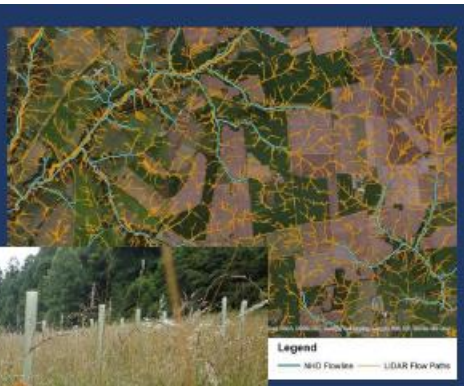


Riparian Buffer

Flow Path Analysis

- Exploring partnerships with SWCD's to use high-res and flow path data to support replicable riparian buffer programs

NEXT: Pilot partnership with Robert E. Lee SWCD Amherst Stream-side Tree Buffer Program



Land Conservation

Amherst Stream-side Tree Buffer Program

-partnering w/ Robert E. Lee SWCD to provide planning and funding support to their grassroots riparian buffer program designed to assist private landowners in buffer installation efforts

ROBERT E. LEE SOIL & WATER
CONSERVATION DISTRICT

Wildlife Habitat Analysis

Refuge Habitat Analysis

- Identified key bird habitat around Presquile NWR

NEXT: Working with contractor to develop landowner toolkit targeted at private land management practices for key bird habitats around Presquile

ENVISION THE James

Chesapeake Conservancy | JAMES RIVER ASSOCIATION | NATIONAL GEOGRAPHIC Maps

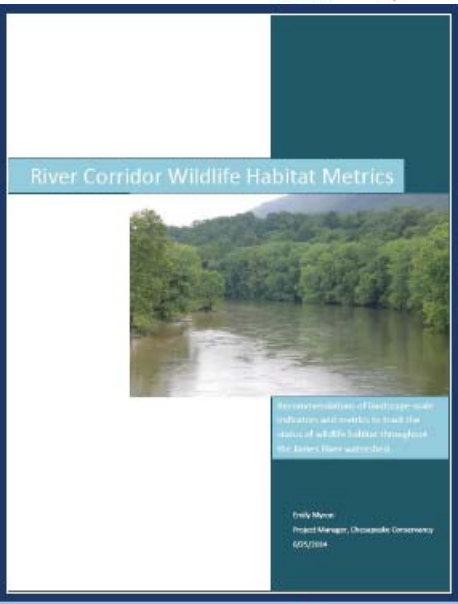
Wildlife Habitat Analysis

Wildlife Habitat Metrics

- Completed report outlining wildlife habitat metrics for the James and a pilot study to determine baseline conditions

NEXT: Carry out baseline study, potentially in partnership with Universities

Available in the GoogleDrive



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Engaging Universities
- Hoping to host UR Bonner Scholar for long-term internship with EtJ (3½ yrs)
- Assembling list of internship opportunities to share with incoming students
- Outreach to student groups with volunteer opportunities
- Hope to integrate some analyses into coursework
- Expanding to new universities
UNIVERSITY OF RICHMOND
VIRGINIA COMMONWEALTH UNIVERSITY
MCV
RPI
1838
VirginiaTech
Invent the Future
HOLLINS
UNIVERSITY
ENVISION THE James
Chesapeake Conservancy
JAMES RIVER ASSOCIATION
NATIONAL GEOGRAPHIC
Maps


Moving Forward
• Please contact us if you are interested in or have any questions about the Envision the James initiative
• Regan Gifford
• rgifford@chesapeakeconservancy.org
• (804) 484-1561
• Justin Doyle
• jdoyle@jrava.org
ENVISION THE James
Chesapeake Conservancy
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Maps

AGENDA
Richmond Regional Planning District Commission
January 8, 2015
9:00 a.m.

RRPDC Board Room
9211 Forest Hill Avenue, Suite 200
Richmond VA 23235

The RRPDC Executive Committee meeting has been **CANCELLED**.

Call to Order ..... **9:00 a.m.**
Pledge of Allegiance

I. ADMINISTRATION

A. Certification of Meeting Quorum by Commission Executive Director – Bob Crum

B. Requests for Additions or Changes to Order of Business – Ken Peterson

C. Open Public Comment Period – Ken Peterson

During the open public comment period, speakers are provided up to three minutes to address the RRPDC Board. Speakers are requested to give their name, locality in which they reside, and if appropriate, the organization they represent.

D. Chairman's Report – Ken Peterson

E. Executive Director's Report – Bob Crum (Tab 1)

F. Environmental and Intergovernmental Reviews – Bob Crum

No Environmental or Intergovernmental Reviews were completed since the report presented during the December meeting.

II. CONSENT AGENDA

A. Meeting Minutes – December 11, 2014 (Tab 2)
B. Financial Reports – November 2014 (Tab 3)

III. UNFINISHED BUSINESS

IV. NEW BUSINESS

A. Informational Presentation on Biosolids and Industrial Residuals Disposal

At a previous RRPDC meeting, Board members requested that the RRPDC schedule an informational meeting to provide officials background information on the biosolids and industrial residuals disposal issue. Staff has made arrangements for a panel of speakers to provide information on the following issues to members of the RRPDC Board:

- Overview of biosolids use in Virginia
- Difference between biosolids and industrial residuals
- Biosolids production and land application
- Regulatory process for biosolids and industrial residuals
- Industrial residuals production and land application
- Science related to biosolids and industrial residuals
- Local concerns and issues

The following speakers will attend the January 8 RRPDC Board meeting to provide background information on the above topics:

- Mr. Robert Crockett, Advantus Strategies/Virginia Biosolids Council

- Mr. James Grandstaff, Division Director, Henrico County Department of Public Utilities Water Reclamation Facility

- Mr. Kyle Winter, Regional Deputy Director/Water Compliance and VPA Program Manager, Virginia Department of Environmental Quality

- Dr. Gregory Evanylo, Ph.D., Professor and Extension Specialist, Department of Crop and Soil Environmental Sciences, Virginia Tech

- Del. Christopher K. Peace, Virginia House of Delegates, 97th District

The purpose of these presentations will be to provide RRPDC Board members as much information as possible on the biosolids and industrial residuals disposal issue and to respond to questions from Commission members. Board members are encouraged to receive the presentations, ask questions of the panel experts, and discuss the information received.

V. OTHER BUSINESS / ANNOUNCEMENTS

VI. ADJOURN

County of Henrico

"Wastewater Treatment and Biosolids Management"

Richmond Regional Planning District Commission 1-8-2015

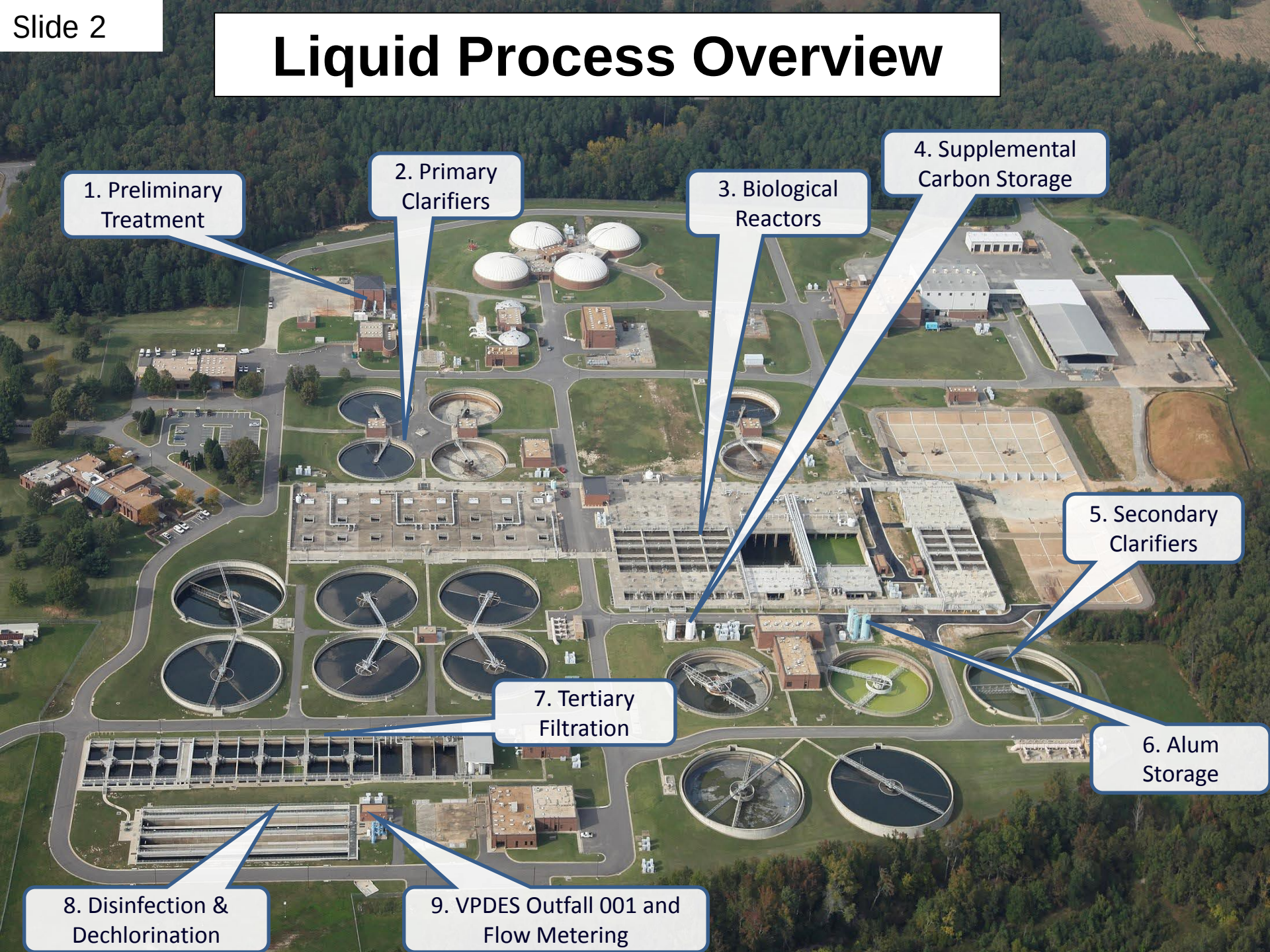
Presented by: James Grandstaff

Slide 1

Keep Henrico Beautiful

Slide 2

Liquid Process Overview



Slide 3

3/8” grate spacing

Preliminary Treatment – Screening

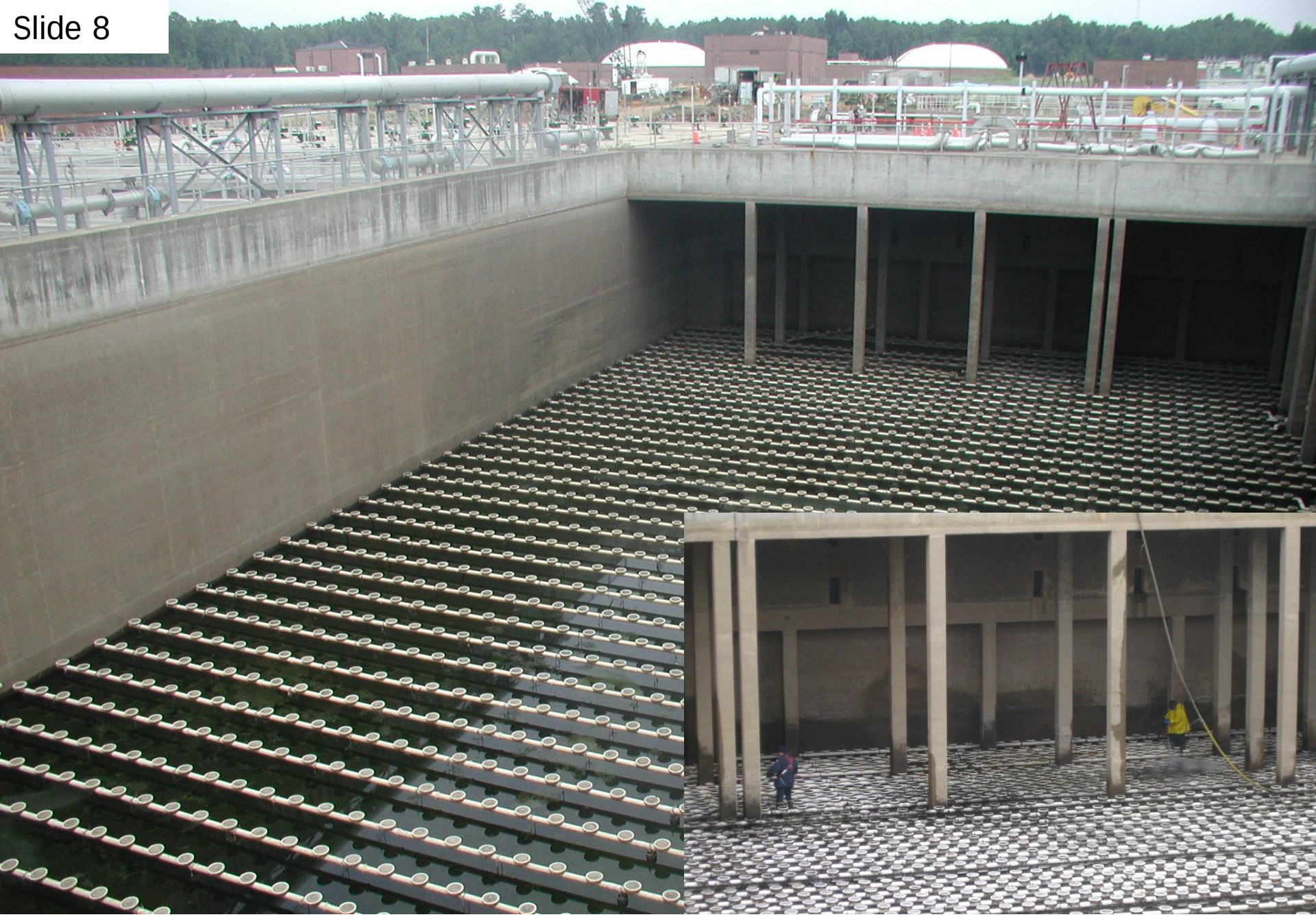
Slide 4

Dewatered screenings - collected for landfill disposal

Washed “Grit” in dumpster – staged for landfill disposal

Primary Clarifier or “sedimentation tank”

Biological Reactors: micro organisms consume the dissolved organic waste (“pollutants”)



Biological Reactor – out of service

Secondary Clarifier – used to settle the micro-organisms generated in the biological reactors

Slide 10

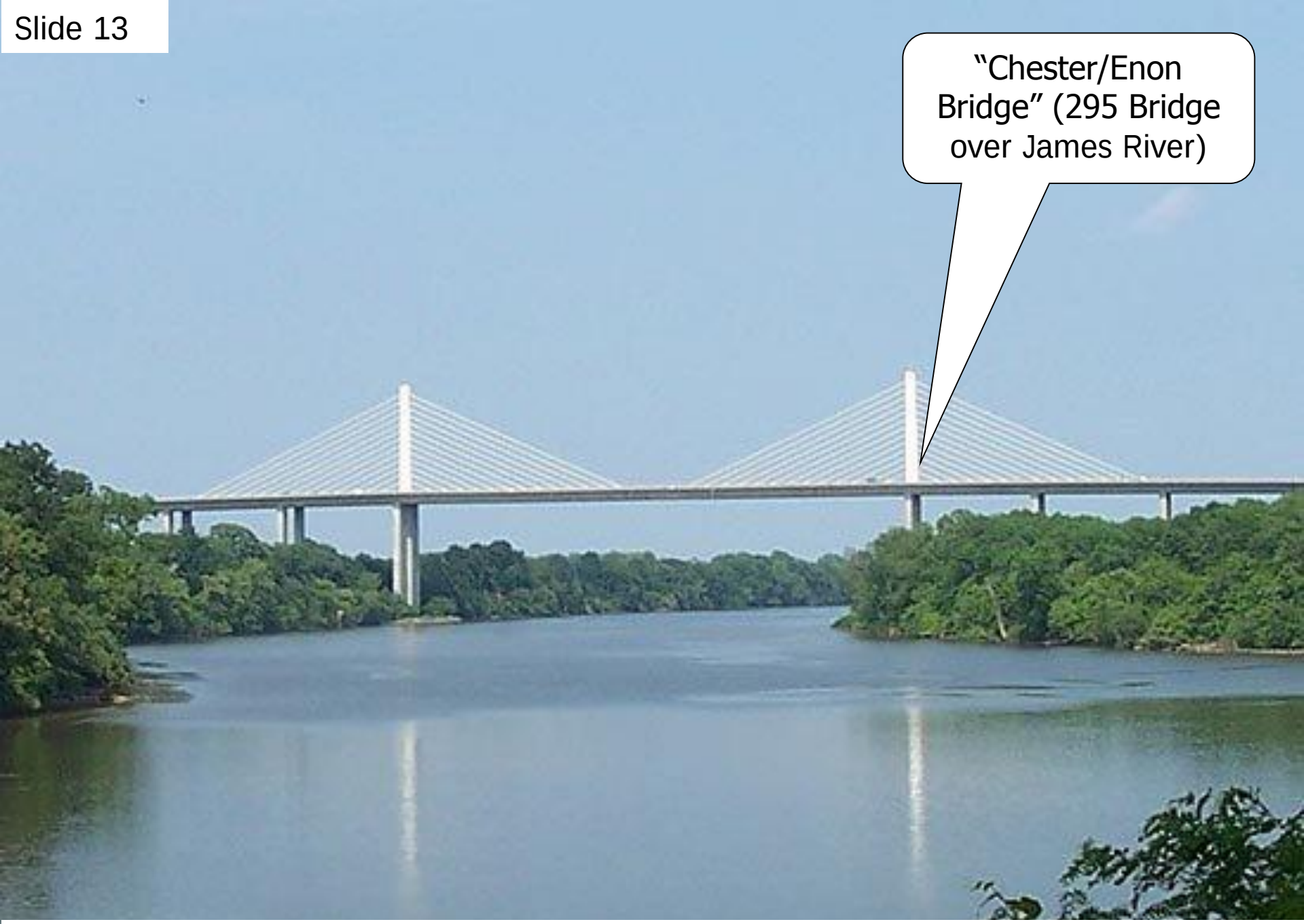
Final Filters and Disinfection

Slide 11

Chlorine Contact Basins - Disinfection

Slide 12

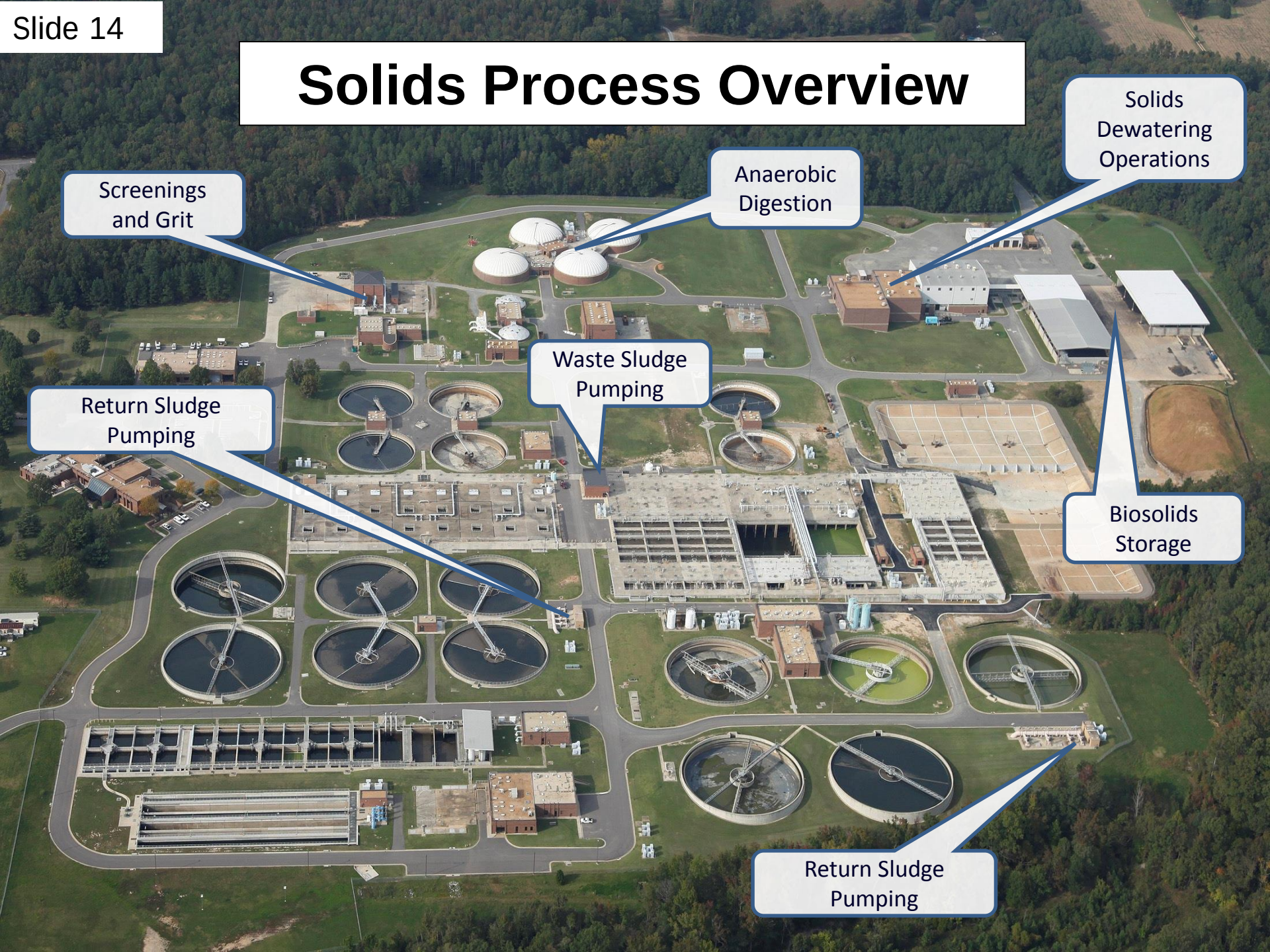
Final effluent – clean water to the James River



James River – VPDES OF 001 (Subsurface Discharge)

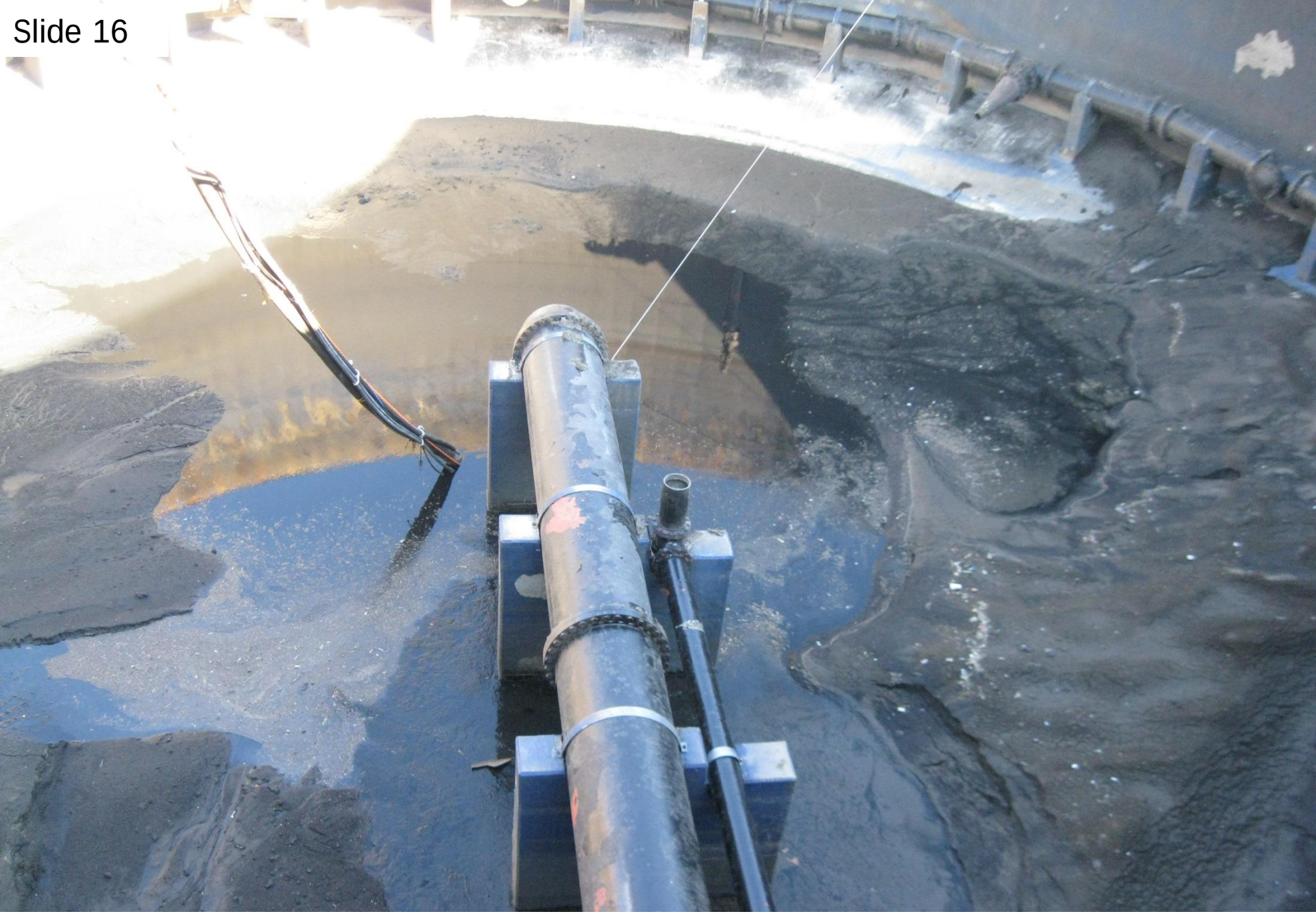
Slide 14

Solids Process Overview



One of four Anaerobic Digesters used to heat and treat solids (tank capacity is 1,600,000 gallons)

Slide 16

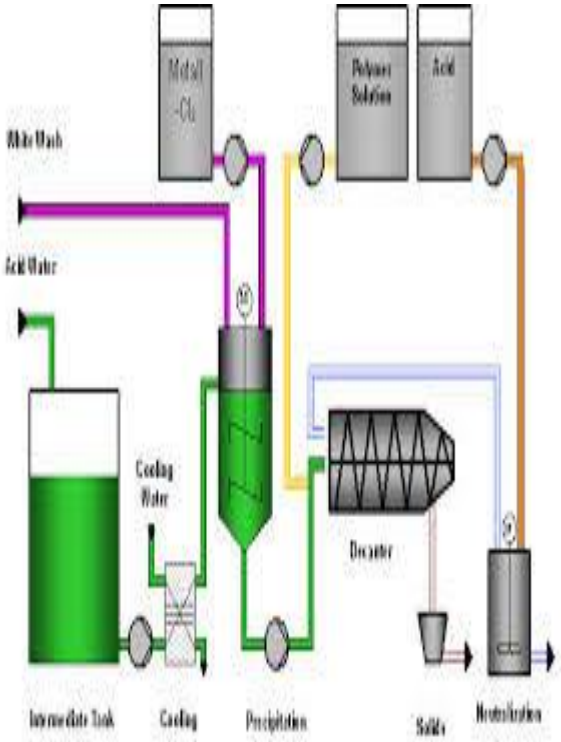


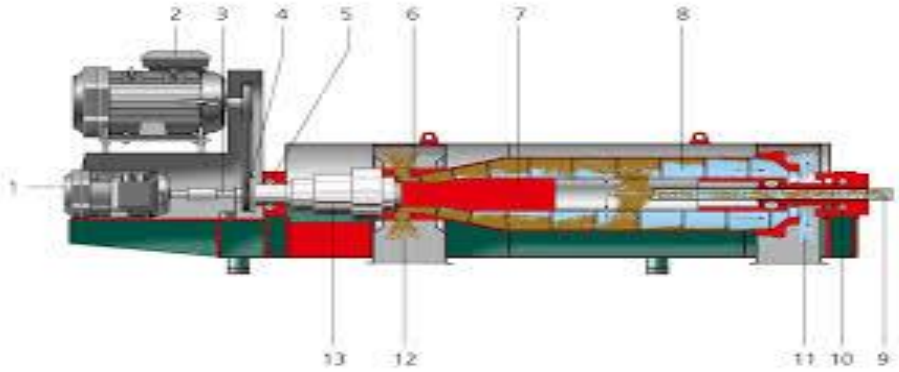
Interior of an Anaerobic Digester (clean out)

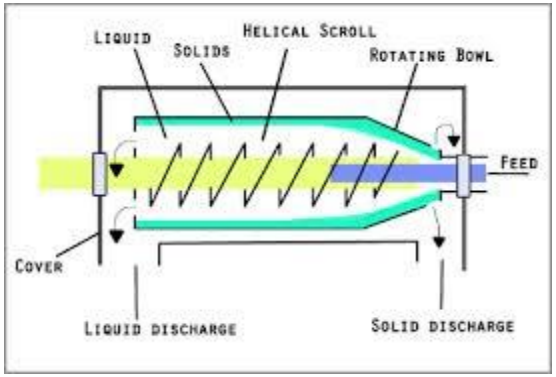
Biosolids are mixed and heated (> 95 °F) continuously to kill pathogens and reduce vector attraction

A portion of the gas that is produced during the anaerobic digestion process is cleaned and used as a fuel source to heat the Digester Tanks and several buildings

Anaerobic Digesters and Flare at sunrise. The excess gas that is produced during the digestion process is flared to atmosphere to protect air quality







Examples of a dewatering centrifuges

Dewatered biosolids (final product ~25% solids) dedicated storage facility (we can hold approximately 60-days of material under roof)

Regulatory Process for Biosolids and Industrial Residuals

Kyle Ivar Winter, P.E.

Department of Environmental Quality
Piedmont Regional Office
4949 – A Cox Road
Glen Allen, Virginia 23060

Topics Covered

- Authorization for program
- DEQ approach to permitting
- History of program
- Industrial residuals vs. biosolids
- VPA permit processing
- Contents of VPA permit

- Land Application of Biosolids and Industrial Residuals represents a way to reuse the nutrient content and soil conditioning properties of the materials involved.
- Many Publicly Owned Treatment Works in the RRPD were designed on the premises that land application would remain economically feasible and administratively permitted; should either of those premises change, it would take time for the affected localities to adapt.
- Alternatives to land application include incineration and landfilling; a broader reliance on these technologies would also require time and would have environmental, social and political ramifications.

Authorization for Program

- Constitution of Virginia, Article 11 recognizes citizens' right to clean air, water and soil.
- § 62.1-44.15 of the Code of Virginia establishes Virginia Pollution Abatement (VPA) permit program.
- 9VAC25-32-30 (VPA regulation) permits land application of industrial waste.
- 9VAC20-130-30 (Virginia Solid Waste Regulation) establishes reuse as preferential to disposal.
- No federal equivalent to VPA program; EPA has historically shown deference to VA.

DEQ approach to permitting

- Due Process for the applicant is required.
- Once application determined complete, will develop a permit unless proposed activity is otherwise prohibited.
- Controversial permits are approved as drafted, approved with modifications or denied, by vote of citizen board approved by the Governor.

History of Program

- IWND/MWND certificates (until early 1990s)
- Individual VPA permits (since 1990s)
- General Permits (animal and poultry waste)
- VDH involvement from mid-1990s to 2007
  - Biosolids program returned to DEQ in 2008
  - VDH-BUR permits currently being phased out

Industrial Residuals vs. biosolids

- Industrial Residuals come from specific activities.
- Waste streams are controlled by the generator of residuals, as opposed to regulation by the generator of biosolids (i.e., local Pretreatment programs).
- Industrial Residual characteristics may be more predictable and more consistent.
- Permits are similar because
  - Industrial Residuals and Biosolids are often intended for similar uses on similar sites, AND
  - Similar operational practices may be reasonably expected to provide similar protection to human health and the environment

VPA processing

- Application includes material characteristics, proposed sites for application and (where applicable) landowner agreements.
- Aside from verifying information on landowner agreement forms is complete and accurate, DEQ does not interfere with arrangements between private parties.
- Localities are notified when the application is received and when the permit is public noticed.
- As stated above, once application is determined to be complete, DEQ is required to develop the permit unless the proposed activity is otherwise prohibited.
- Controversial permits may go to hearing if
  - Significant public interest;
  - Substantial disputed issues, AND
  - Action requested is not inconsistent with state or federal laws or regulations.

Types of Permits

- Biosolids – under VPA program (third party application) or VPDES program (generator applies own biosolids)
- Industrial wastewater – under VPA program (typically on dedicated site owned by generator/permittee)
- Industrial residuals – under VPA program (similar to biosolids application)
- VDACS certification for commercial marketing

Typical Limits and Conditions

- Application Rate Determined by Nutrient Management Plan (NMP), and is based on:
  - Soil fertility;
  - Soil productivity;
  - Crop to be grown, and
  - Propensity of field to lose nutrients to surface and ground water .
- Includes restrictions on timing to ensure crop utilization of applied nutrients.
- Some NMPs must be approved by VADCR.

Typical Limits and Conditions

- Two concepts regarding metals limits:
  - Ceiling limitation, not to be exceeded at any time, and
  - Cumulative pollutant loading, which limits the total amount applied to a field over its lifetime.
- Metals concentrations in many materials proposed for application are lower than found in some commercial fertilizers and are comparable to Class A biosolids (which may be marketed for consumer use).
- Frequency of analysis is dependent on the amount applied; as little as once/year and as often as once/month.

Pathogen Reduction

- Several options exist to demonstrate reduction of pathogens to meet Class B treatment standards:
  - Digestion (time and temperature requirements)
  - Air drying for three months
  - Composting
  - pH adjustment

Vector Attraction

- Several options exist to demonstrate reduction of vector attraction:
  - Reduction of volatile solids
  - Dewatering
  - Digestion (time and temperature requirements)
  - pH adjustment
  - Incorporation or injection into soil

Notification Requirements

Notification

- 100-day notification to locality.
- 14-day notification to locality and DEQ.
- 24-hour notification to locality and DEQ.
- Notification to locality and DEQ at sign posting.

Signage requirements

- At least 5 business days before land application at site begins.
- Sign cannot be removed until at least 30 days after land application at site has ended.

Frequency of Application

Up to full agronomic N need for one year crop rotation period, once per three years.

If greater than 50% of agronomic N need is supplied, more often than once in three years, the NMP must be pre-approved by DCR.

Other Contents of VPA Permits

- Monitoring and Reporting Requirements
- Special Conditions pertaining to minimizing discharge to state waters except during 25 year, 24-hour storm event
  - Setbacks/buffers
  - Nutrient Management
  - Other site restrictions
- Boilerplate (emergency reporting, duration of permit, other standard conditions)

Other Permit Conditions

- Depth to water table
- Depth to bedrock
- Slopes >15%
- Snow-covered ground
- Requirements for land-applier certification
- Odor Control Plan
- Transport

Questions?

Crop and Soil Environmental Sciences
www.cses.vt.edu

Biosolids and Industrial Residuals: Properties and Uses

Greg Evanylo

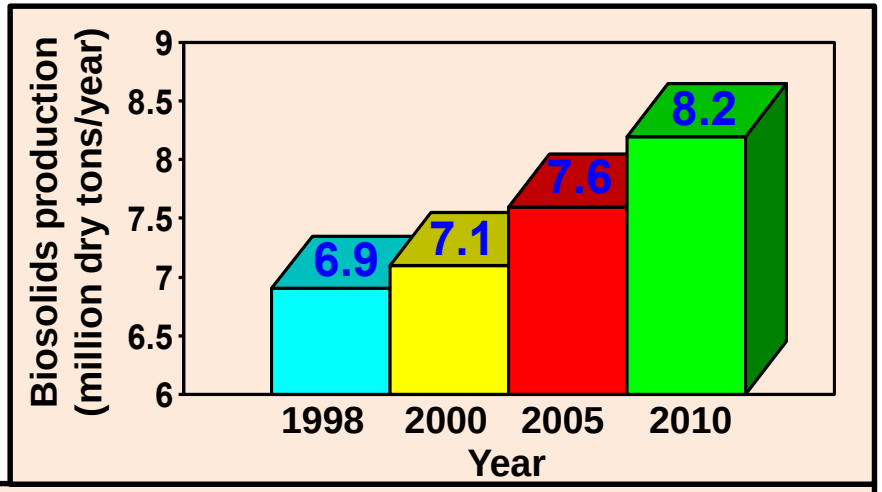
Professor and Extension Specialist

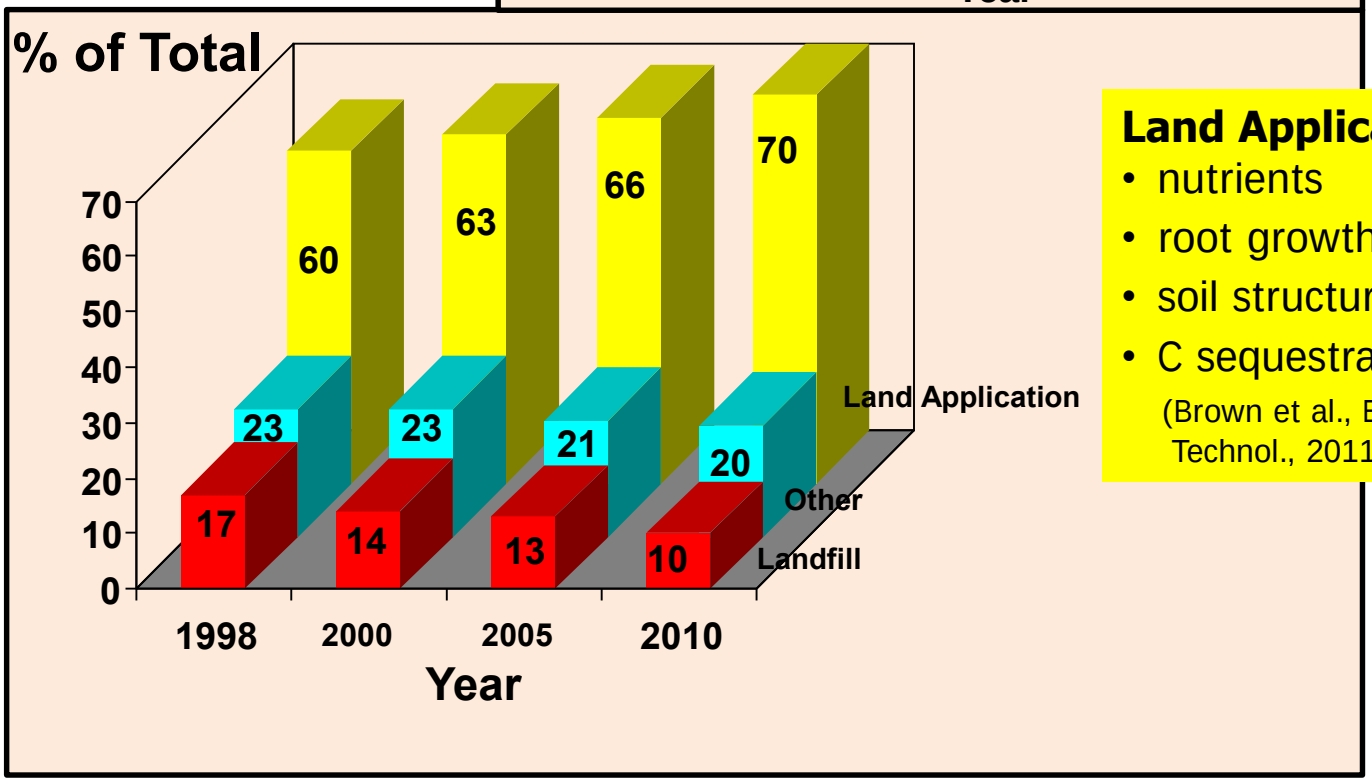
Richmond Regional Planning District Committee Meeting

January 8, 2015

VirginiaTech
Invent the Future

Biosolids production, usage, and disposal in U.S.





Land Application Benefits:

- nutrients
- root growth promoters
- soil structure improvement
- C sequestration

(Brown et al., Environ. Sci. Technol., 2011, 45:7451)

Metal concentrations (ppm) in various fertilizer sources and Part 503 Standards

Element	Biosolids	Poultry manure	Phosphate fertilizer	Part 503 PCL
As	5.0	13	11	41
Cd	4.4	2.4	65	39
Cu	425	465	57	1500
Pb	76	46	12	300
Mo	12	19	NA	---
Ni	33	16	28	420
Zn	735	602	240	2800

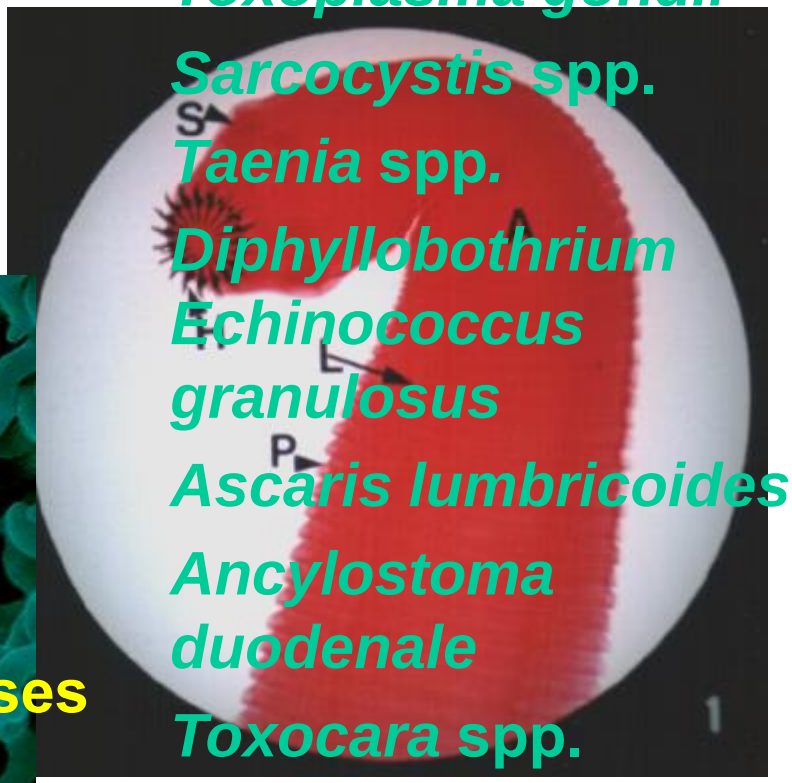
BACTERIA

Salmonella spp.
Shigella spp.
Escherichia coli
Vibrio cholera
Clostridium
Leptospira spp.
Mycobacterium
Yersinia spp.
Listeria spp.
Campylobacter
Staphylococcus
Streptococcus
Pseudomonas

VIRUSES

Poliovirus
Coxsackievirus
Echovirus
Adenovirus
Reovirus
Hepatitis
Rotavirus
Astrovirus
Calicivirus
Norwalk agents
Small round viruses
Parvovirus

PARASITES



Entamoeba histolytica
Giardia lamblia
Toxoplasma gondii
Sarcocystis spp.
Taenia spp.
Diphyllobothrium
Echinococcus granulosus
Ascaris lumbricoides
Ancylostoma duodenale
Toxocara spp.
Cryptosporidium

What are TrOCs?

Human uses

- Prescription drugs
- over-the-counter drugs
- Therapeutic drugs
- Veterinary drugs
- Fragrances
- Cosmetics
- Sun-screen products
- Diagnostic agents
- Nutraceuticals (e.g., vitamins)
- Illegal drugs
- Flame retardants
- Additives in consumer products

Trace Organic Chemicals








Animal production uses

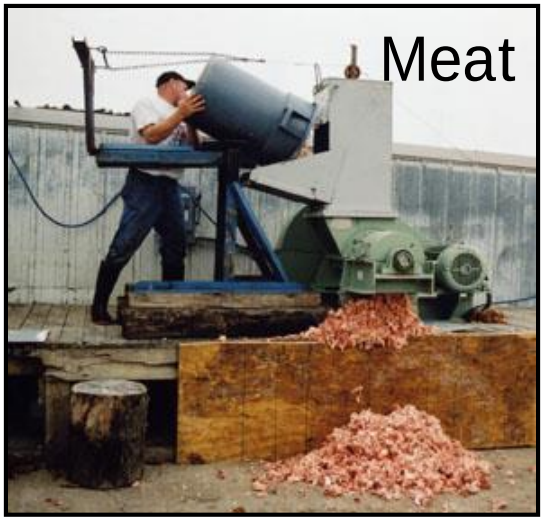
- Therapeutic (disease control)
- Sub-therapeutic (growth promotion)

Kang Xia, CSES, VT

Virginia Tech CSES Industrial By-product Testing Program & Cooperating State Agencies

- Virginia Department of Agriculture & Consumer Services (VDACS) – Labels and regulates fertilizers, liming products, soil amendments, potting soils, etc.
- Virginia Department of Environmental Quality (DEQ) – Their waste definition allows for industrial by-products that are beneficially recycled to be excluded from "waste" designation and be considered as a VDACS-registered soil amendment.

Various Industrial Wastes



Industrial Residuals?

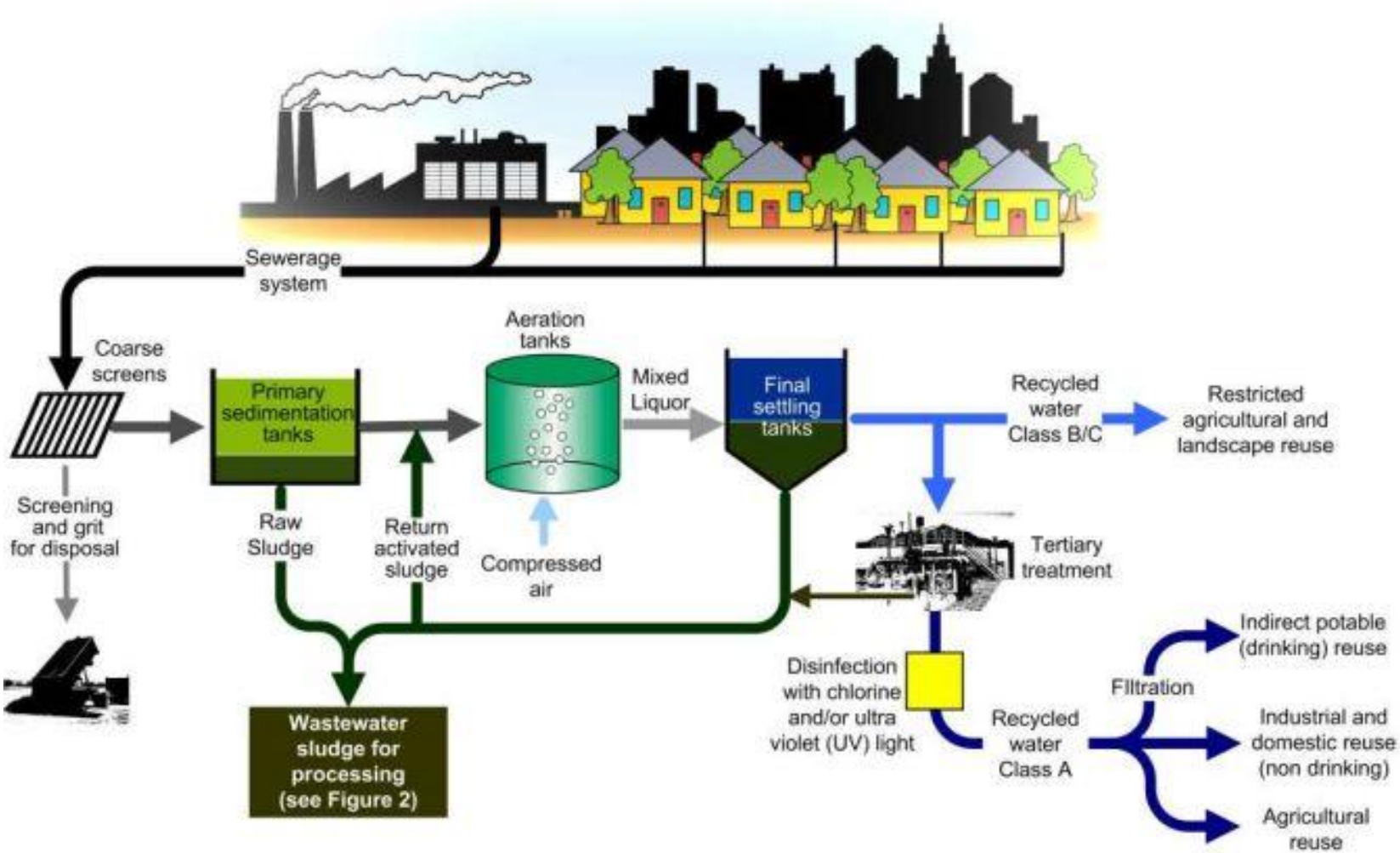
By-product Properties Necessary to Evaluate Land Application Benefits and Drawbacks

Property	Use
Total, inorganic and organic N	Calculate plant available N (PAN)
Volatile solids, Organic matter	Determine carbon content, value as soil amendment
P, K, S, Ca, Mg, micronutrients	Calculate nutrient supply
Heavy metals	Prevent toxicity to plants and animals, food chain concerns
Electrical conductivity (EC), soluble salts, Na	Prevent phytotoxicity and soil structure destruction
pH, CaCO3 equivalency	Determine liming potential, nutrient availability

Wood Ash Analysis

Parameter	Value	Parameter	Value
pH	12.5	As (mg/kg)	8.2
Electrical conductivity (dS/m)	28	B (mg/kg)	115
Calcium carbonate equivalence (%)	37	Cd (mg/kg)	1.2
Total carbon, C (%)	1.5	Cr (mg/kg)	20
Total nitrogen, N (%)	0.02	Cu (mg/kg)	16
Phosphorus, P (%)	0.13	Mo (mg/kg)	0.31
Potassium, K (%)	2.3	Ni (mg/kg)	7.6
Sulfur, S (%)	0.35	Pb (mg/kg)	26
Calcium, Ca (%)	5.9	Se (mg/kg)	0.80
Magnesium, Mg (%)	0.65	Zn (mg/kg)	44

WWTP Processing



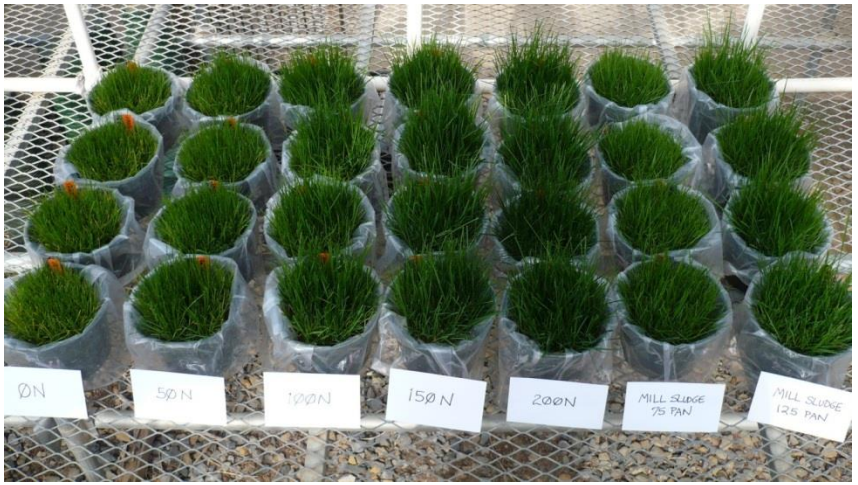
Poultry Dissolved Air Floatation Sludge

Property	Conc	Lbs per dry ton	
		Total	Plant-available
Solids (%)	7.9		
Total N (%)	4.6	93	32
P (%)	0.6	11	26 (P_2O_5)
K (%)	0.03	0.6	1 (K_2O)

Papermill Sludge Analysis

Parameter	Value	Parameter	Value
Total N (%)	1.34	Fe (ppm)	1600
P (%)	1.34	Cu (ppm)	13
K (%)	0.04	Zn (ppm)	54
S (%)	0.61	Heavy metal concentrations: 1-2 orders of magnitude < USEPA 503 Rule standards.	
Organic matter (%)	46		
Ca (%)	11.8		
Mg (%)	0.28		

Testing Papermill Residuals



Assessing N availability

Assessing growth promotion and phytotoxicity

Biosolids and Industrial Residuals Use Summary

- Benefits
  - Inexpensive supply of nutrients and lime
  - C sequestration
  - Potential environmental stress amelioration
- Lower health and environmental risk from commonly land-applied industrial residuals than from biosolids

References for Evaluating and Managing Non-biosolids Residuals

- Brandt, R.C. and K.S. Martin. 1996. The food processing residual management manual. Natural Resource, Agriculture and Engineering Service (NRAES). Ithaca, NY. NRAES-92.
- J.F. Power and W.A. Dick (Editors). 2000. Land application of agricultural, industrial, and municipal by-products. SSSA Book Series No. 6. Soil Science Society of America, Inc. Madison, WI.

AGENDA

Water Quality Roundtable Meeting

May 7, 2015

RRPDC Board Room
9211 Forest Hill Avenue, Suite 200
Richmond, VA 23235

CALL TO ORDER ……..……1:30 P.M.

1:30 Welcome, Introductions, & Update Notes

1:35 Chesterfield IDDE Traveling Carwash Kit – Chesterfield County

2:00 Regional Stormwater Permit – Timmons & City of Richmond

2:30 Integrated Permit Planning Process – City of Richmond

3:00 Round Robin Discussion

3:30 Adjourn

CLEANER WATER FASTER

Building a Better City: Richmond's Integrated Water Resources Plan

Photo by RVA Paddlesports

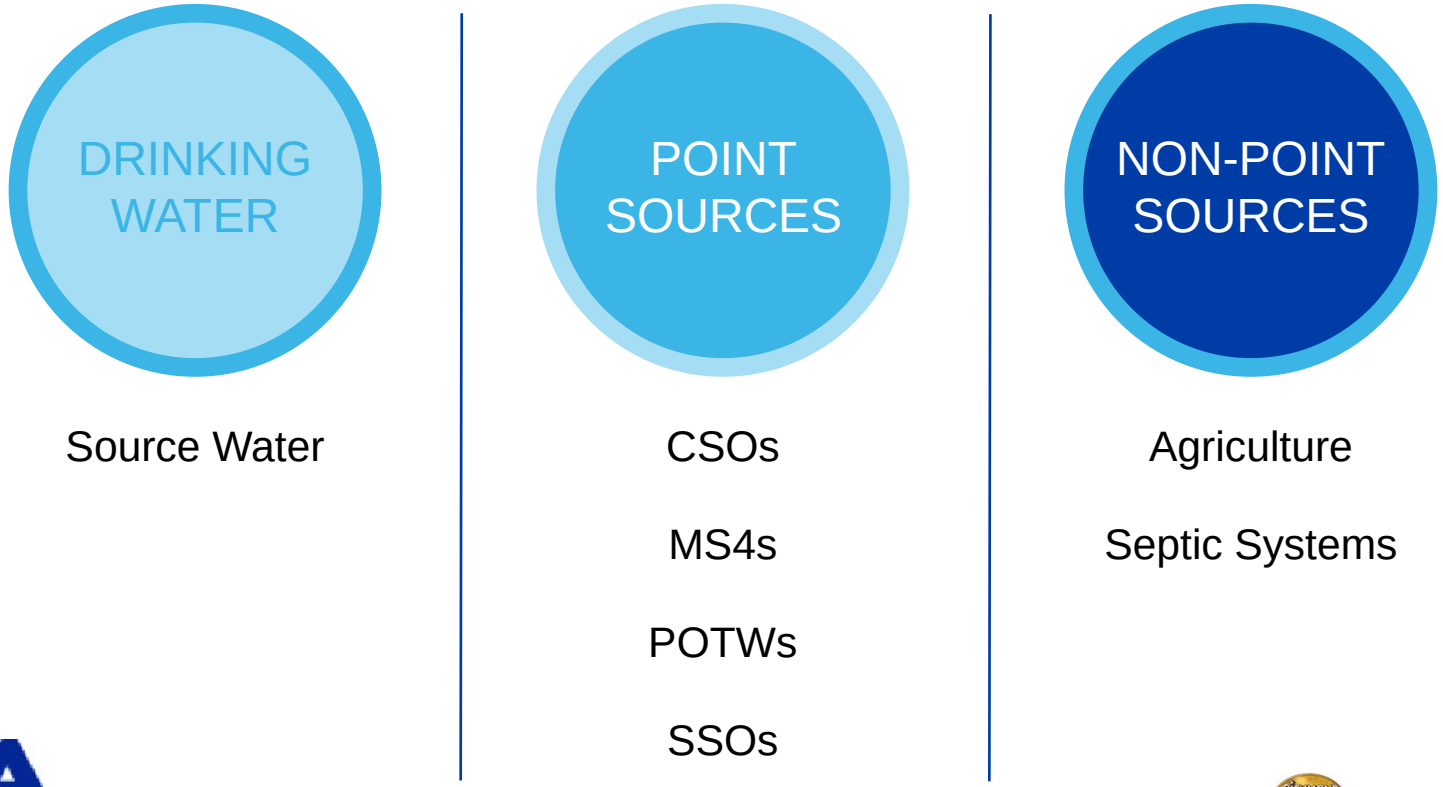
RVA H2O
EVERY DROP COUNTS

RVAH2O.org

City of Richmond
Department of Public Utilities

Previous Approach

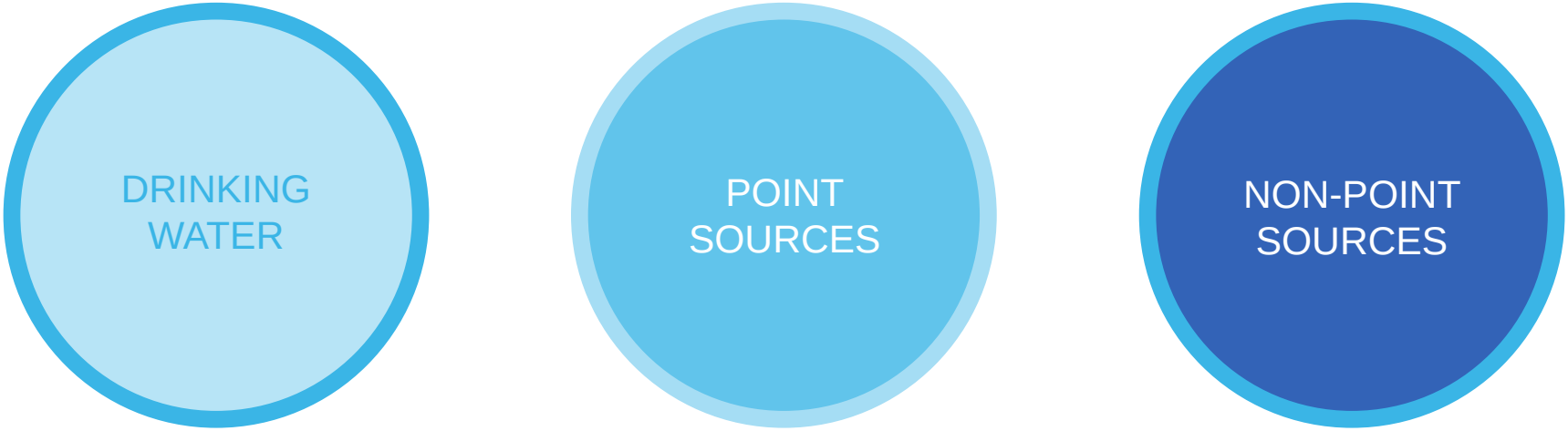
Multiple Programs, Lack of Coordination



RVA H2O
EVERY DROP COUNTS

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES

Integrated Resources Planning & Permitting



RVA H2O
EVERY DROP COUNTS

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES

New Approach: Integration and Coordination

Watershed Management Plan (WMP)

- Set goals
- Identify sources

Integrated Plan (IP)

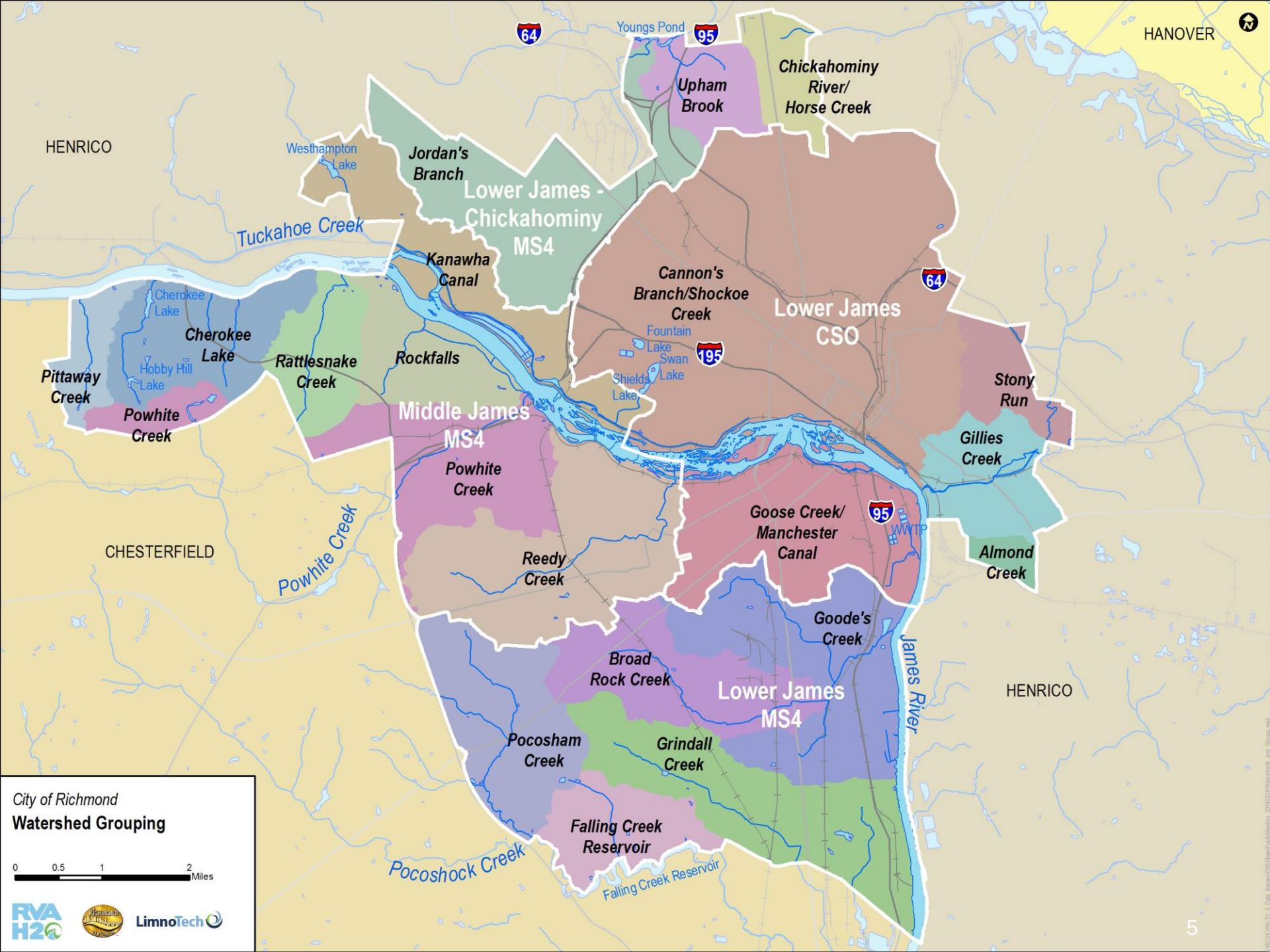
- Determine resource needs

Watershed-Based Permit (WBP)

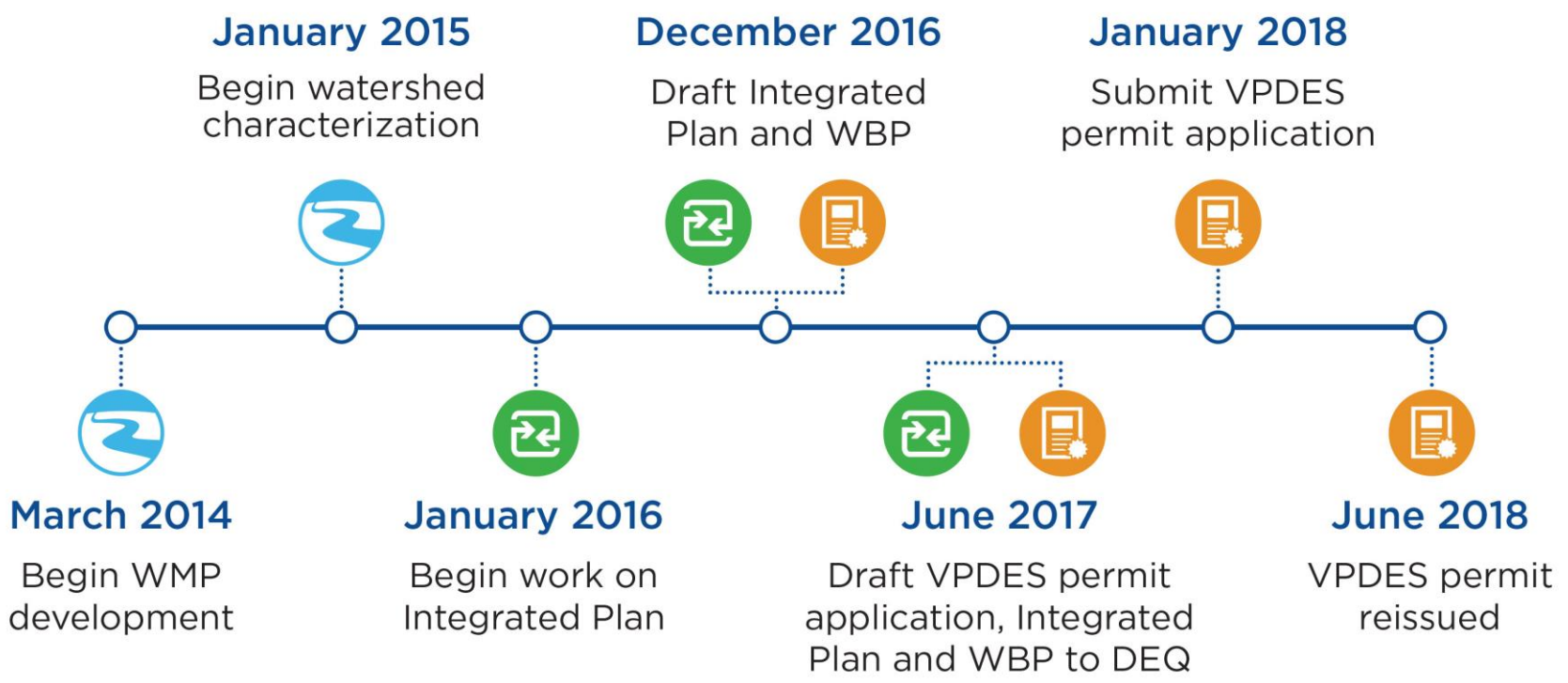
- Implementation

RVA H2O EVERY DROP COUNTS

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES


HANOVER
HENRICO
CHESTERFIELD
HENRICO
Youngs Pond
64
95
Upham Brook
Chickahominy River/ Horse Creek
Westhampton Lake
Jordan's Branch
Lower James - Chickahominy MS4
Tuckahoe Creek
Kanawha Canal
Cherokee Lake
Cherokee Lake
Hobby Hill Lake
Pittaway Creek
Powhite Creek
Rattlesnake Creek
Rockfalls
Cannon's Branch/Shockoe Creek
Fountain Lake
Swan Lake
Shields Lake
195
Lower James CSO
64
Stony Run
Gillies Creek
Middle James MS4
Powhite Creek
Powhite Creek
Reedy Creek
Goose Creek/ Manchester Canal
95
WWTP
Almond Creek
Goode's Creek
Broad Rock Creek
Lower James MS4
James River
Pocosham Creek
Grindall Creek
Falling Creek Reservoir
Pocoshock Creek
Falling Creek Reservoir
City of Richmond
Watershed Grouping
0
0.5
1
2
Miles
RVA H2O
LimnoTech

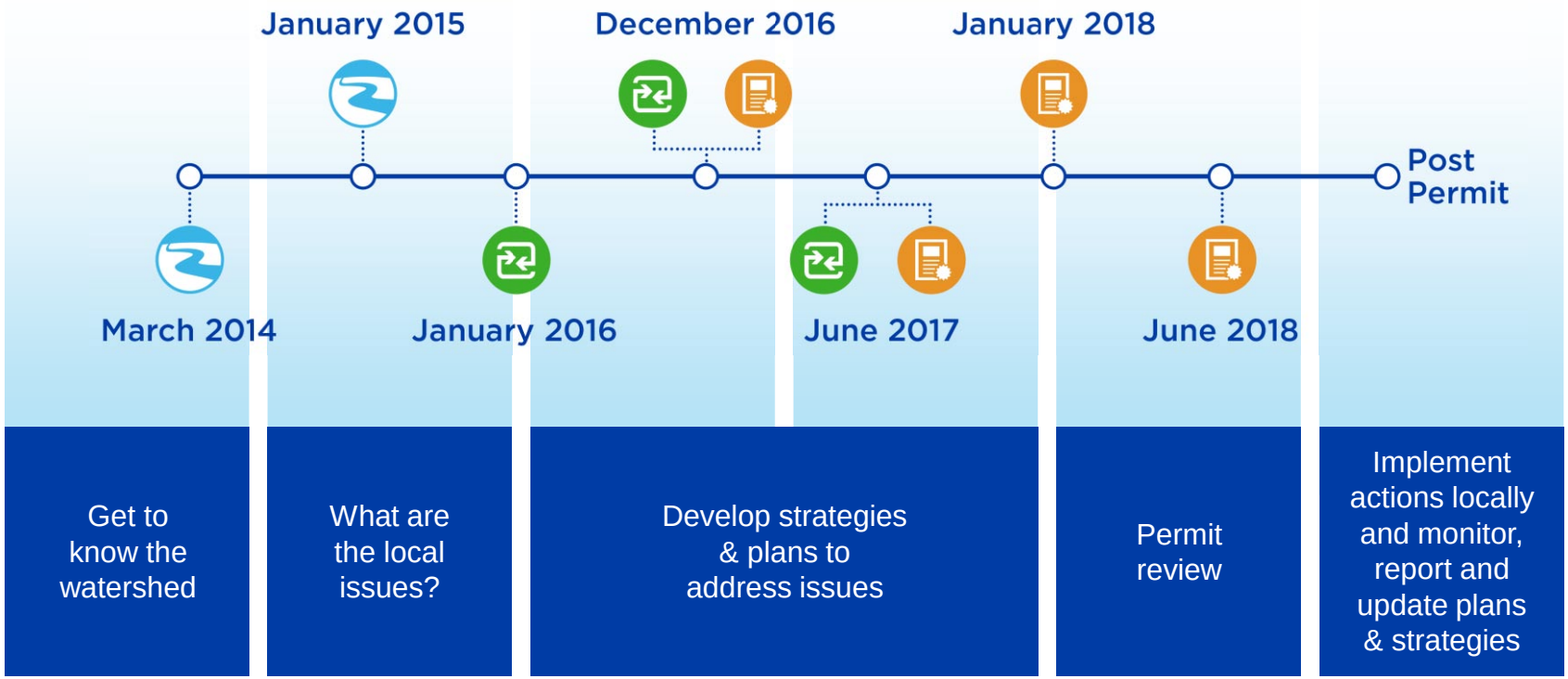
Timeline



RVA H2O
EVERY DROP COUNTS

City of Richmond
Department of Public Utilities

Stakeholder Involvement



RVA H2O
EVERY DROP COUNTS

CITY OF RICHMOND
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Stakeholder Groups

(Partial List)

RVAH2O.org

RVA H2O
EVERY DROP COUNTS

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES

Meetings with Technical Stakeholders, Special Interest Groups & the Public

RVA H2O
EVERY DROP COUNTS

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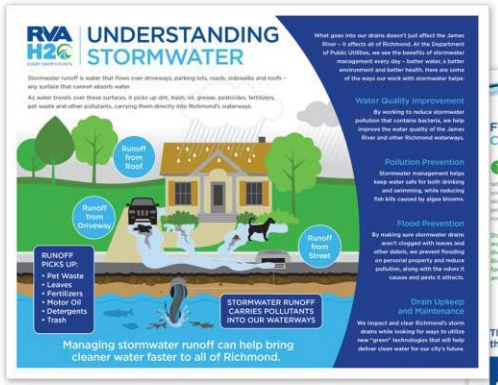
DEPARTMENT OF PUBLIC UTILITIES

Outreach Materials



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EVERY DROP COUNTS

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES

Next Steps: Sources, Stressors and Loadings

Riparian channel alteration, wastewater inputs, stormwater runoff

Water/Sediment quality, temperature, hydrology, physical habitat, energy sources

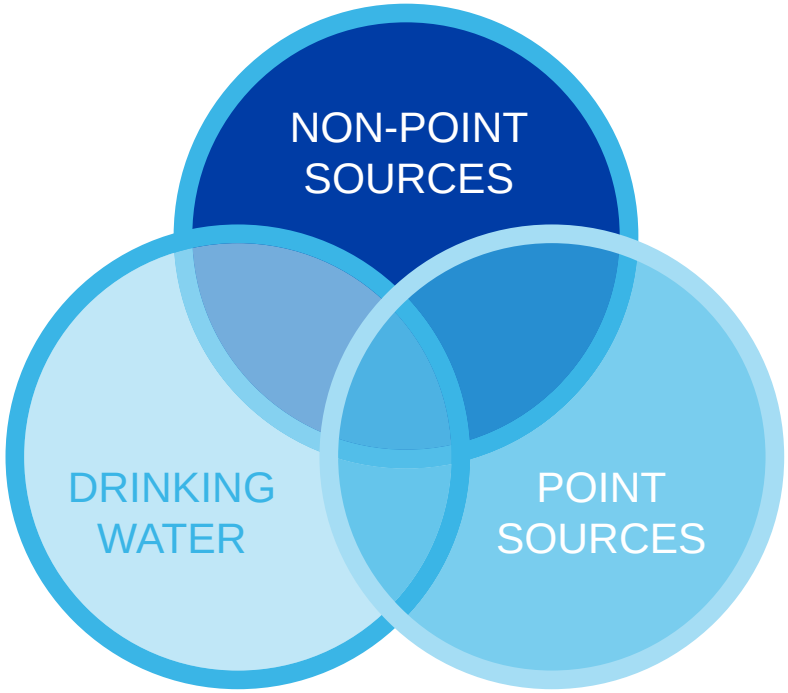
Pounds of pollutants

How these data are factored into implementation

RVA H2O
EVERY DROP COUNTS

City of Richmond
Department of Public Utilities

Integrated Water Resources Management Plan

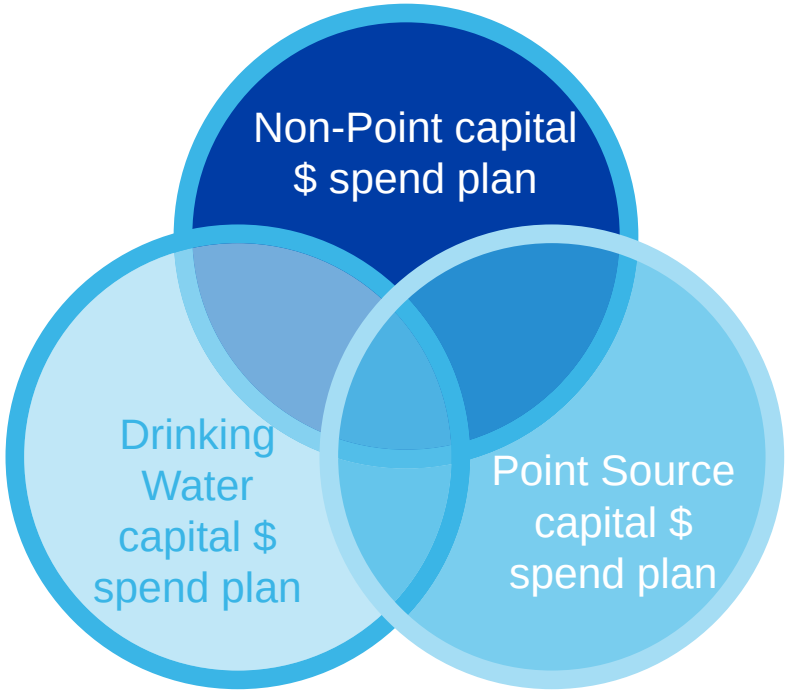


Integrated to ensure all water resources are included

RVA H2O
EVERY DROP COUNTS

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES

Integrated Water Resources Financial Management Plan



Integrated financial plan to ensure each dollar spent in priority order results in cleaner water faster at affordable cost to the ratepayer

RVA H2O EVERY DROP COUNTS

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES

QUESTIONS?

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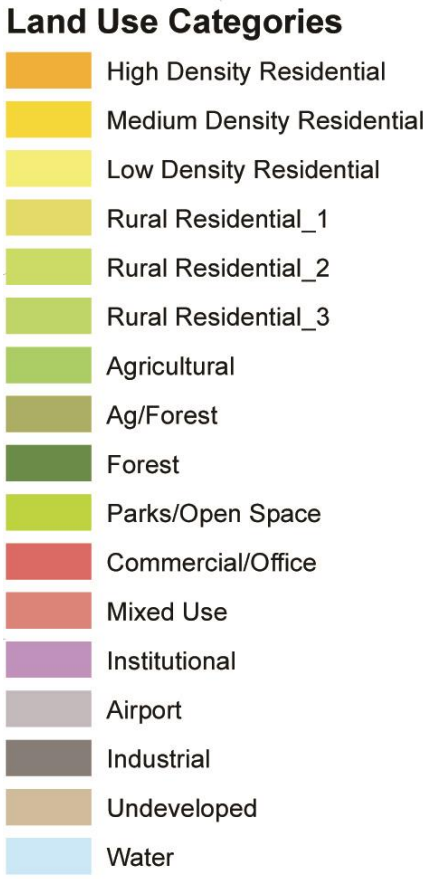
RVA H2O
EVERY DROP COUNTS

CITY OF RICHMOND
DEPARTMENT OF PUBLIC UTILITIES

APPENDIX C

CATEGORY DESCRIPTIONS
Regional Existing Land Use Inventory 2015

The following categories were created to display a uniform and consistent dataset to represent land uses across the region, to be used in the regional existing land use inventory. To update the regional existing land use inventory conducted in 2009, RRPDC staff compared each parcel across the region to the aerial photography flown by the Virginia Geographic Information Network (VGIN) in December of 2013, released in January of 2014. Since the 2009 dataset was an amalgamation of various datasets from each jurisdiction, comparing that dataset to new aerials was determined to be the most accurate method of creating a newer and even more accurate dataset.



There were actually two simultaneous datasets created in 2015: a correction of the 2009 dataset and any actual changes in land use. Because 2015 work marked the first time each individual parcel was looked at, there was opportunity to correct not only any mistakes made by RRPDC staff in the previous dataset, but also any inaccuracies which would have been in the original locality datasets. In order to compare "apples to apples", a corrected version of the original dataset had to be created.

Each parcel was labeled with one of the following categories:

High Density Residential: parcels less than 0.2 acres, as well as apartment complexes, condos and mobile home parks, all on one parcel

Medium Density Residential: >= 0.2 and <0.5 acres

Low Density Residential: >=0.5 and <2 acres

Rural Residential_1: >=2 and <5 acres

Rural Residential_2: >=5 and 10 acres

Rural Residential_3: >=10 and <20 acres

Commercial/Office: This category includes retail, office and food service, etc.

Parks/ Open Space: Parks, golf Courses, ball parks, tennis courts and cemeteries.

Institutional: This category includes prisons, schools, and government buildings, as well as churches and other parcels previously labeled "public/semi-public" in urban/suburban jurisdictions.

Industrial: This category includes both heavy and light industrial as well as public utilities, cell tower parcels, water treatment plants and other municipal service locations.

Agricultural: These are parcels that are at least 80-90% plowed, tilled or planted area. Also includes pasture, barns, silos etc. This was done entirely by aerials (in rural localities we didn't have the information, and in the suburban counties these parcels were all labeled as vacant).

Airport. Both commercial and general aviation airports.

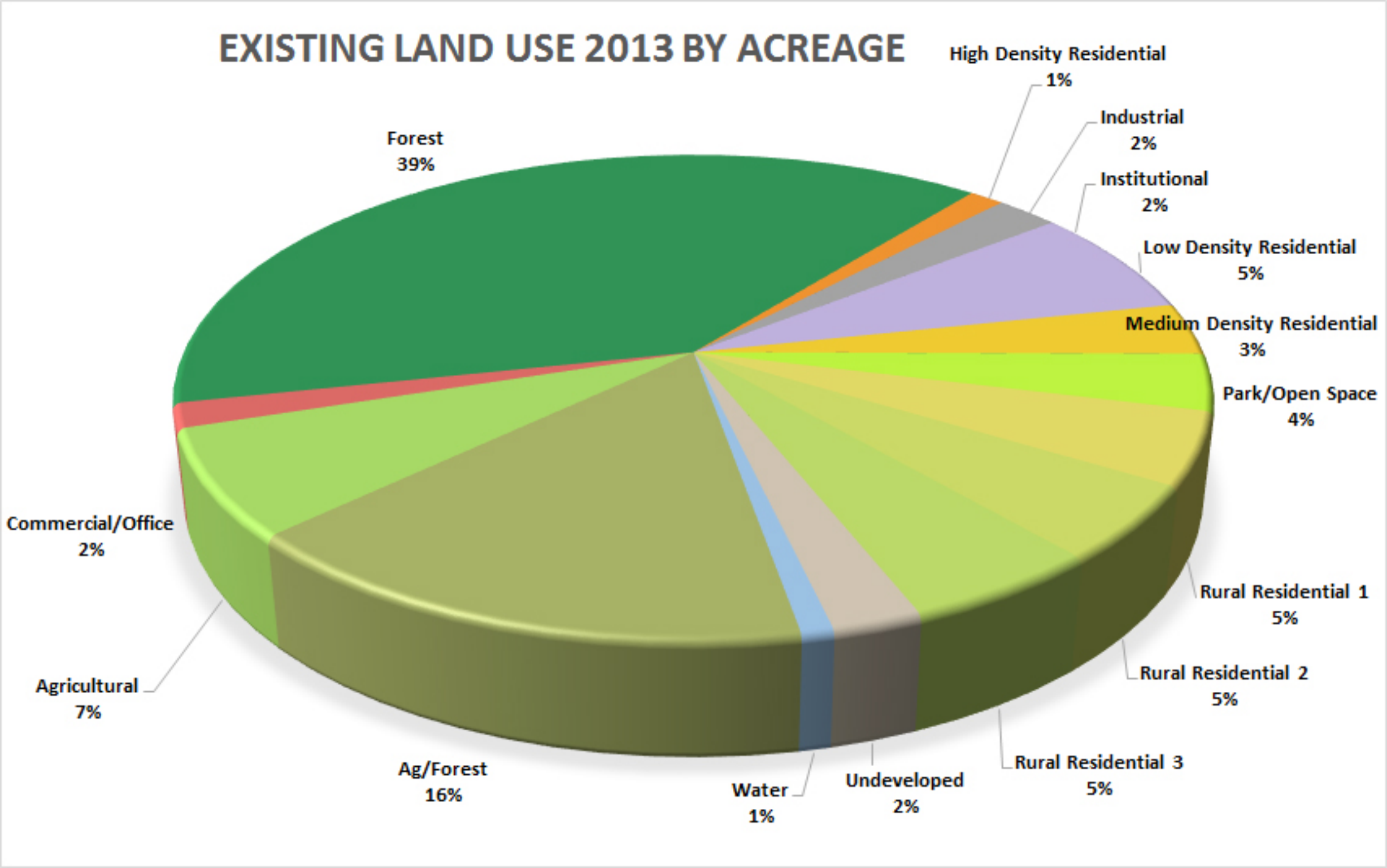
Ag/Forest: These parcels were roughly between 40/60% of one or the other agricultural or forested, all also done by aerials.

Forest: These are parcels that are at least 80-90% forested. Most of them were 100% forested.

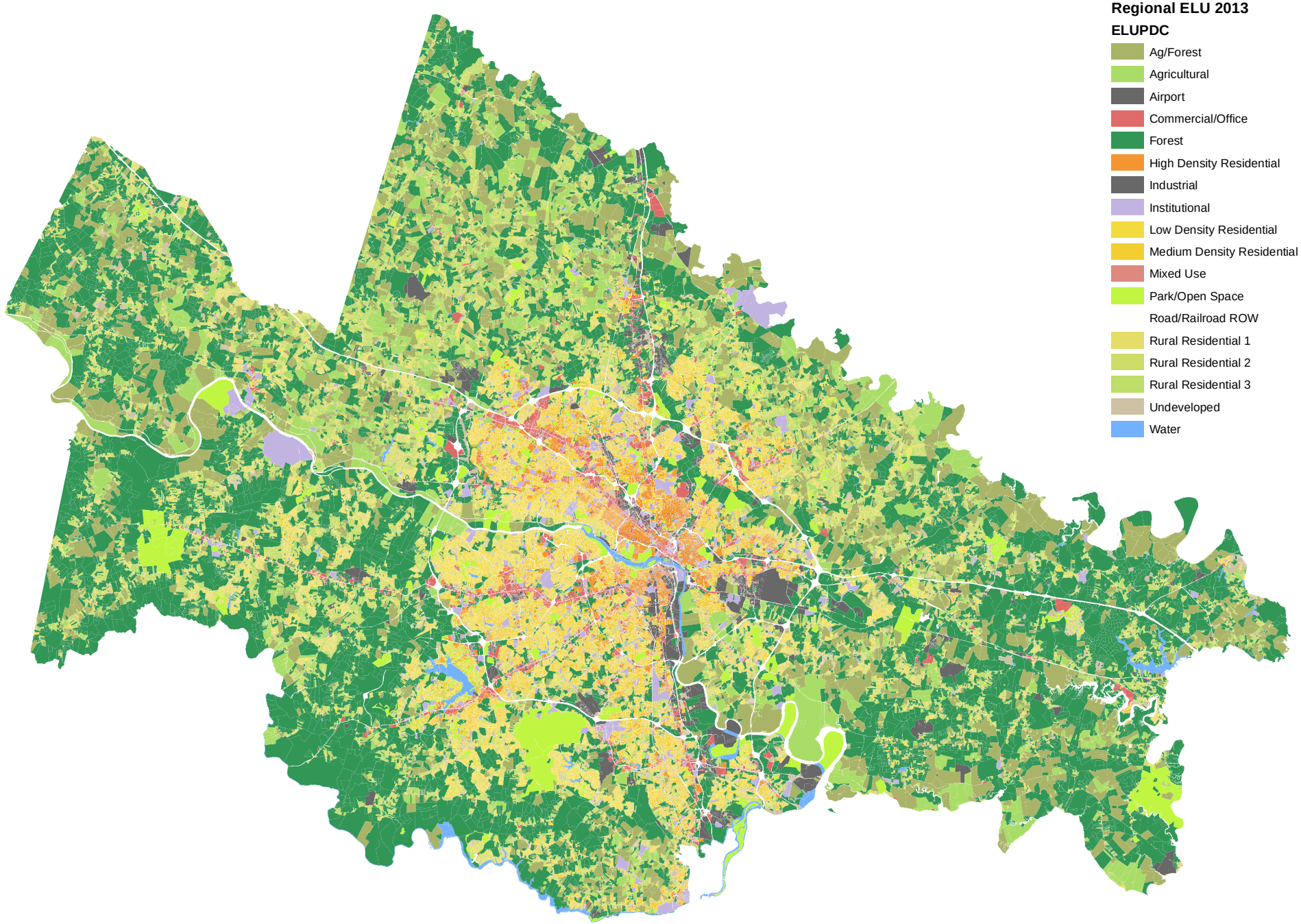
Undeveloped: Small parcels (under 5 acres) that have been subdivided but have not been built upon.

Mixed Use: An area in which there is a mix of commercial, office and residential uses, determined by the jurisdiction.

EXISTING LAND USE 2013 BY ACREAGE

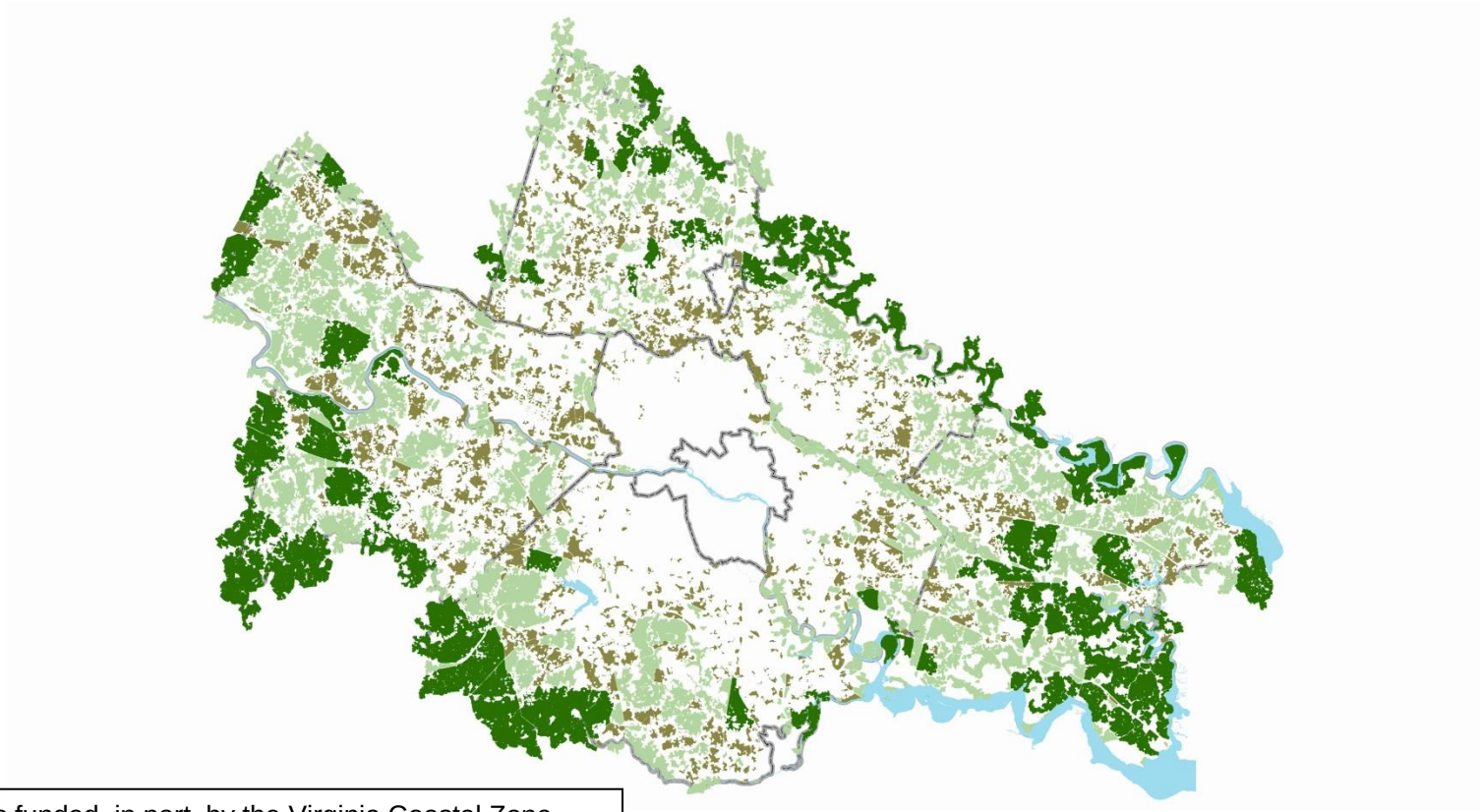


REGIONAL EXISTING LAND USE INVENTORY 2013



APPENDIX D

Richmond Region Green Infrastructure Base Map Update



This project was funded, in part, by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY13 #NA13NOS4190135 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Grant Number: NA14NOS 4190141

Task Number: 48

Virginia Coastal Zone MANAGEMENT PROGRAM

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Background

The state-wide ecological forest core layer, named the Virginia Natural Landscape Assessment, was initially created by Virginia Department of Conservation and Recreation Division of Natural Heritage (DCR-NH) staff in 2007 based on year 2000 aerial imagery and various GIS datasets. RRPDC staff completed the first update of this ecological core layer for the Richmond Region using local structure/building data in 2009. The update used 2007 aerial imagery available from VGIN.

In 2015, RRPDC staff performed the second update of the Richmond Region Ecological Forest Core GIS layer using locally available building/structure data and gap filling using aerial imagery available from VGIN from 2013. With the completion of this second update, three iterations of the ecological forest core GIS layer have been completed: the first based on data from 2000, the second updated to 2007, and the third updated to 2013. Using these three datasets, RRPDC staff can analyze change in land cover and ecological core integrity over time.

Update Methodology

RRPDC staff developed the update methodology in consultation with DCR-NH staff and staff from the Green Infrastructure Center, a non-profit located in Charlottesville, VA. The steps for the update process are as follows:

1. Buildings/structures located in ecological cores are identified using GIS.
2. 100 meter buffers are applied to the buildings to imitate the impact of development on the ecological function of forest cores.
3. The 100 meter buffers are removed from the ecological core geography using GIS, much like a hole-puncher is used on a sheet of paper.
4. Any remaining cores less than 10 acres are removed from the data set as being too small for ecological integrity and relevance in the DCR-NH model.
5. The cores are rescored using area loss as a proxy for a full rerun of the DCR-NH model. The ecological cores were initially scored using a 1 – 5 scale; 1 was the highest score of most intact ecological value and 5 was the lowest on the scale for ecological value. For the rescore process, a core's score changed by 1 for every 20% area loss. If a core's score became a 6 or more, it was flagged as needing further analysis; the rate of area change relative to the initial area of the core is so great that a full re-run of the model is necessary to accurately rescore the core.

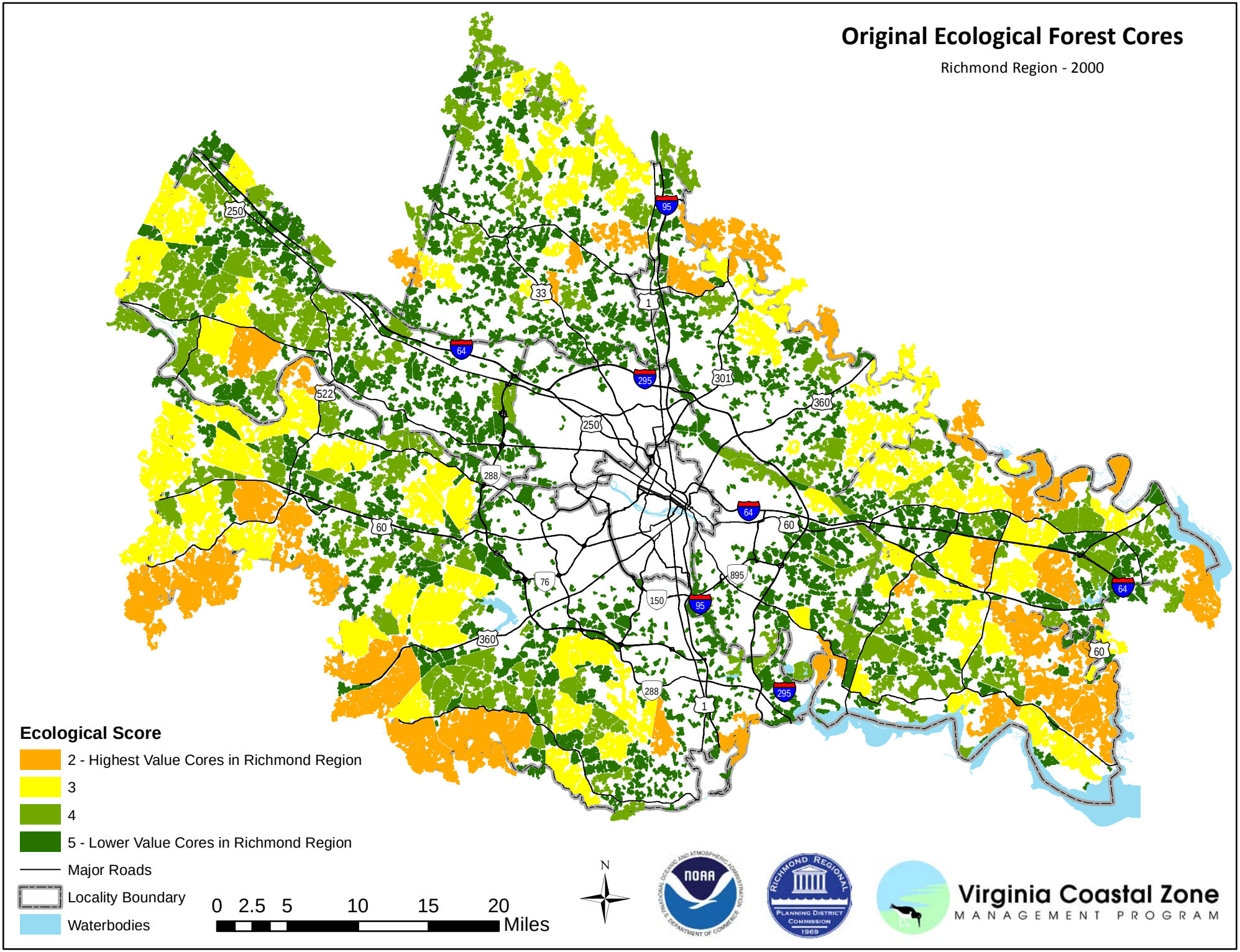
Ecological Cores over Time

This series of maps presents the ecological cores in the Richmond Region over time. The first map is the original cores layer based on data from the year 2000. The second map is the cores layer based year 2007 data. The final map is the latest update based on year 2013 data. In all maps

forest cores are depicted by score value using a scale ranging from green to orange; this scale mimics the initial mapping of the forest cores as performed by DCR-NH staff with the first state-wide ecological forest core GIS layer. In the last two maps, forest area removed due to development is depicted as dark gray while those cores that have been flagged as requiring a full rerun of the model for rescoring are symbolized with light gray.

Original Ecological Forest Cores

Richmond Region - 2000



Ecological Score

- 2 - Highest Value Cores in Richmond Region
- 3
- 4
- 5 - Lower Value Cores in Richmond Region
- Major Roads
- Locality Boundary
- Waterbodies

0 2.5 5 10 15 20 Miles

N

Virginia Coastal Zone MANAGEMENT PROGRAM

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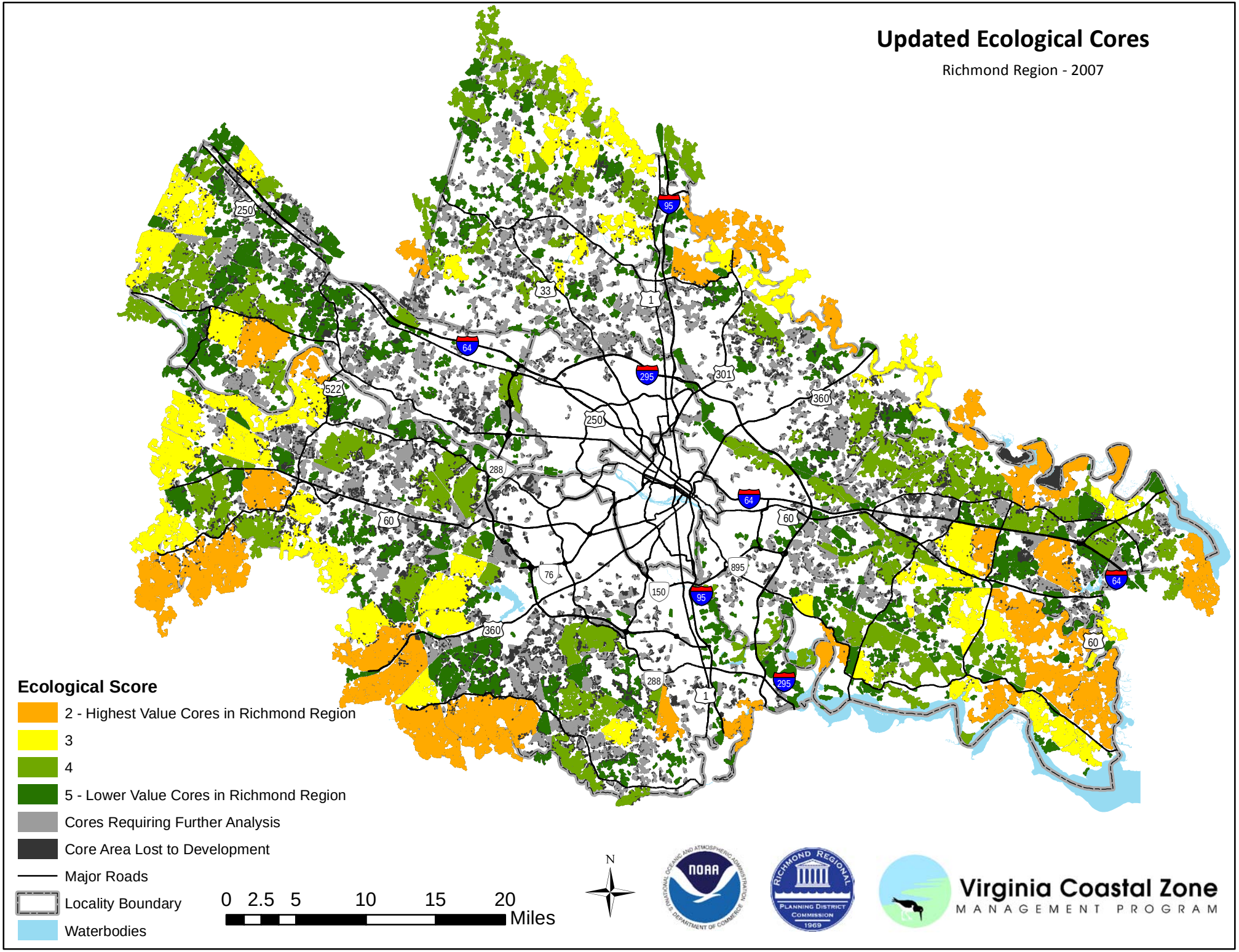
Updated Ecological Cores

Richmond Region - 2007



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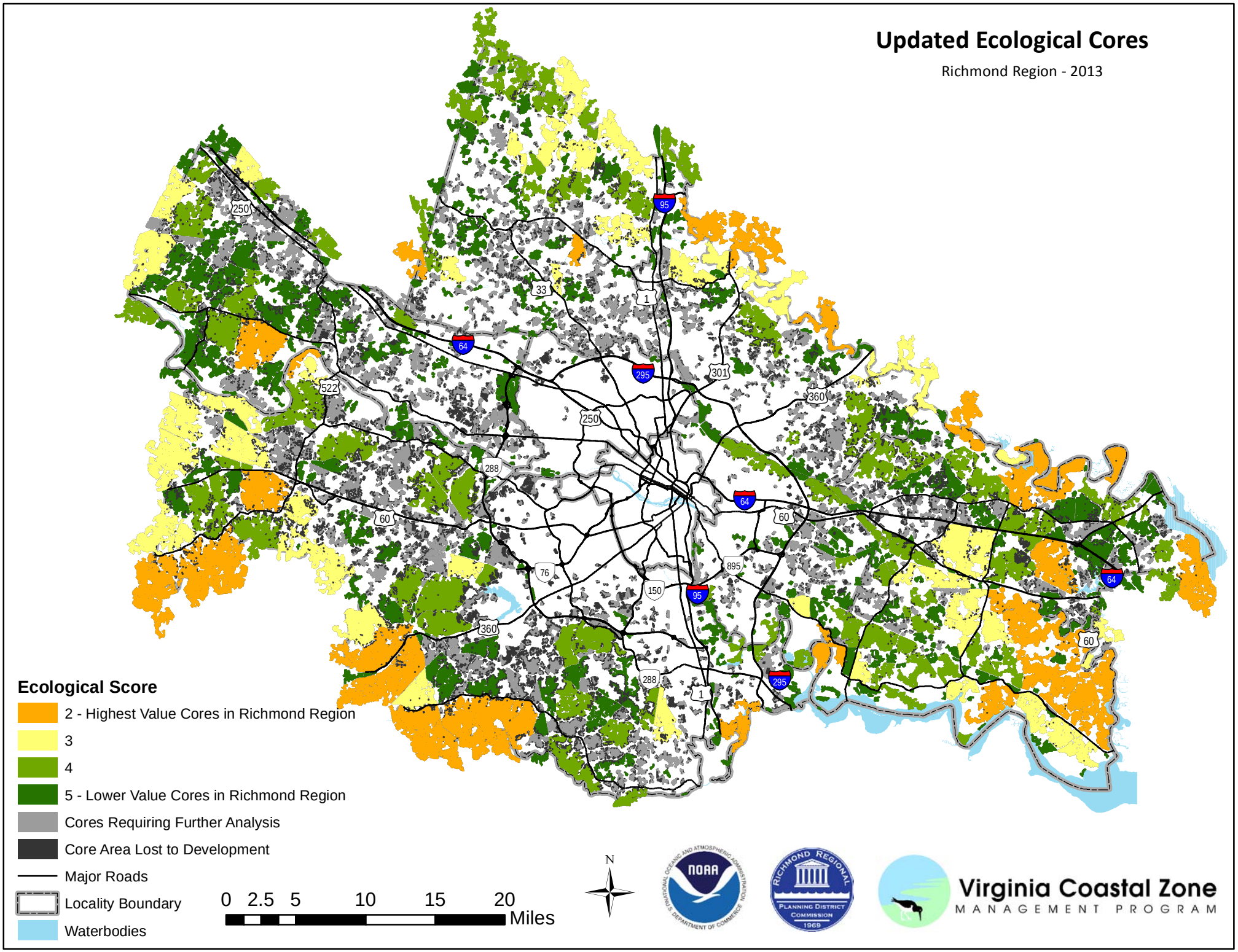
Updated Ecological Cores

Richmond Region - 2013



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The charts below summarize core acreage and score changes over time.

The rate of loss of core integrity (score) and area was greatest during the economic peak time between 2000 and 2007. The following recession drastically slowed core loss as development came to a near standstill. Indeed, the annual rate of core loss from 2000 – 2007 was 14,715 acres per year in the Richmond Region. From 2007 – 2013, the rate of loss was more than 10,000 acres per year less, or 4,421 acres per year. Nonetheless, ecological cores continued to degrade. By 2013, cores identified as requiring further analysis due to their amount of change relative to their starting acreage accounted for 20% for total core area in the Richmond Region and 60% of all remaining cores.

Acres of Core by Score

	1		2		3		4		5		Cores Requiring Further Analysis (6+)		Total	
	#	%	#	%	#	%	#	%	#	%	#	%	#	%
2000	0	0%	158,244	20%	213,229	27%	178,071	22%	247,893	31%	0	0%	797,437	100%
2007	0	0%	137,965	20%	126,383	18%	154,458	22%	150,680	22%	124,943	18%	694,429	100%
2013	0	0%	129,929	19%	109,430	16%	149,249	22%	142,918	21%	136,375	20%	667,901	100%

Annual Acreage Rate of Loss

2000-2007	14,715.41
2007-2013	4,421.37

Green Infrastructure Theme Mapping

The ecological forest core layer can be used with other data sets to map the status of the green infrastructure network in the Richmond Region. The following two maps depict such theme mapping. On both maps, the ecological forest cores have been divided into two groups: high value cores and low value cores. High value cores are those with a score of 2 or 3. Lower value cores are those with a score of 4 or 5. This grouping was used to simplify ecological core data presented in order to maintain legibility of the map given the addition of theme based data.

Water Quality

The updated ecological core layer is paired with 2012 GIS data from the Virginia Department of Environmental Quality's biannual Impaired Waters Report. The complex classification system used by DEQ is simplified into 2 categories of water bodies: impaired and not impaired. Impaired waters are dispersed throughout the Richmond Region; the causes for impairments vary from bacteria, to heavy metals, to dissolved oxygen. While each watershed in the region is unique, a general truth is evident on the map. Watersheds with more intact forest core are more likely to have healthy waters without impairment.

A future, more detailed analysis could better place value on the ecological cores in the Richmond Region by investigating the impairment status of a water body and the percent of forest core land within the watershed over time. Such an analysis may be undertaken in FFY15 as RRPDC staff venture to perform more complex analyses using this updated forest core GIS data with land cover and land use data.

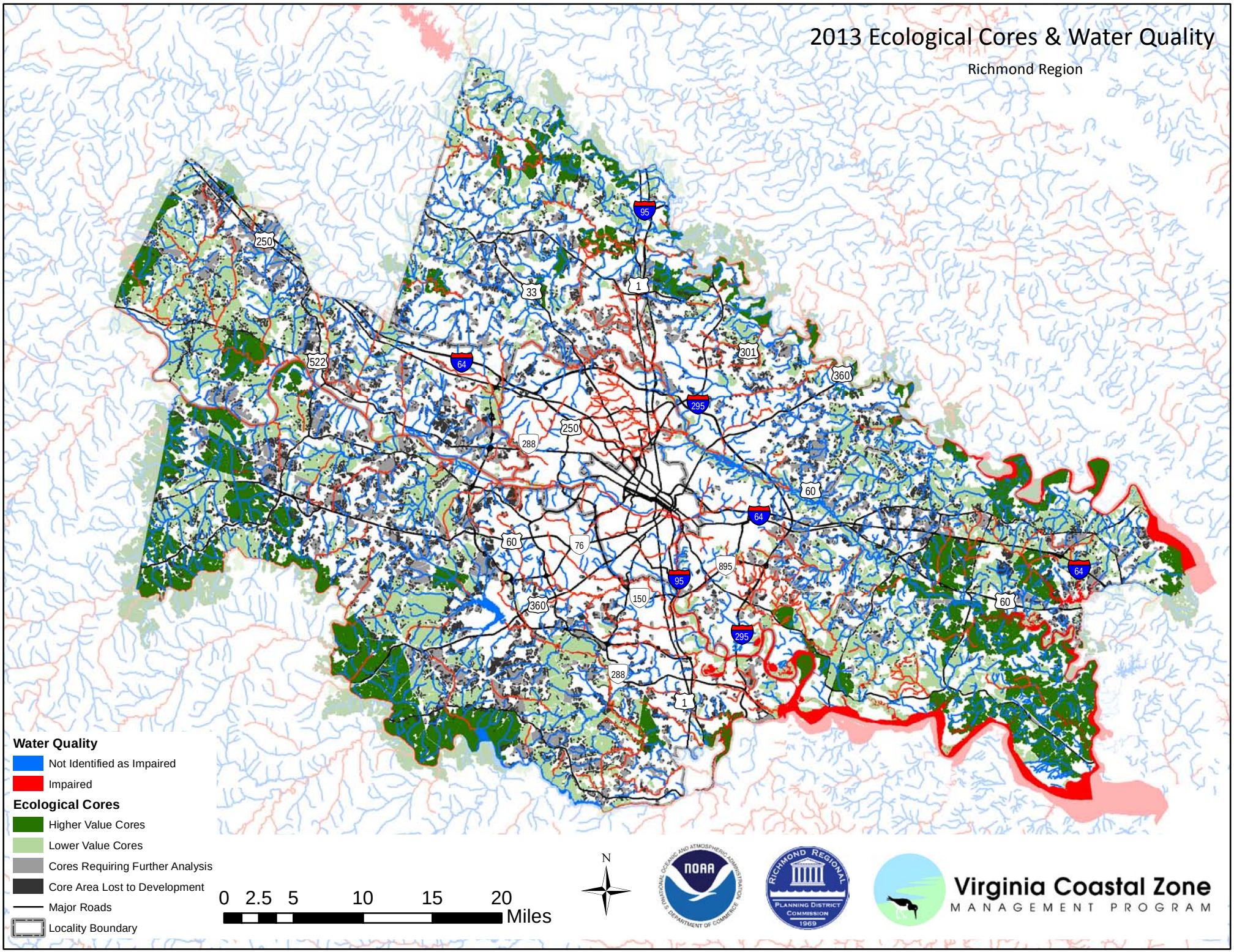
Recreation

The updated ecological core layer is paired with park facilities and river access points in the Richmond Region. The use and importance of this map lies in the value of connecting ecological cores and recreational facilities across the landscape. Connecting ecological cores allows native wildlife and plants to move across the landscape and prosper provided and increased likelihood of protection from invasive, non-native species. Connecting human recreational assets to each other and ecological forest cores serves two purposes. First, connection of recreational assets is an often sought aspect of a recreation network as it allows users transportation options other than automobiles, such as bicycling and walking, between assets. Second, ecological cores can act as forest buffers for recreational assets, increasing their appeal.

An excellent example of the connection of recreational assets and ecological cores is the Virginia Capital Trail that stretches from the City of Richmond east along Virginia Route 5 to the City of Williamsburg. The off-road, multi-use trail takes users past parks, historic areas, and forested expanses allowing for healthy recreational opportunities while encouraging rural economic development as users stop along the way to purchase goods, food, and refreshments.

2013 Ecological Cores & Water Quality

Richmond Region



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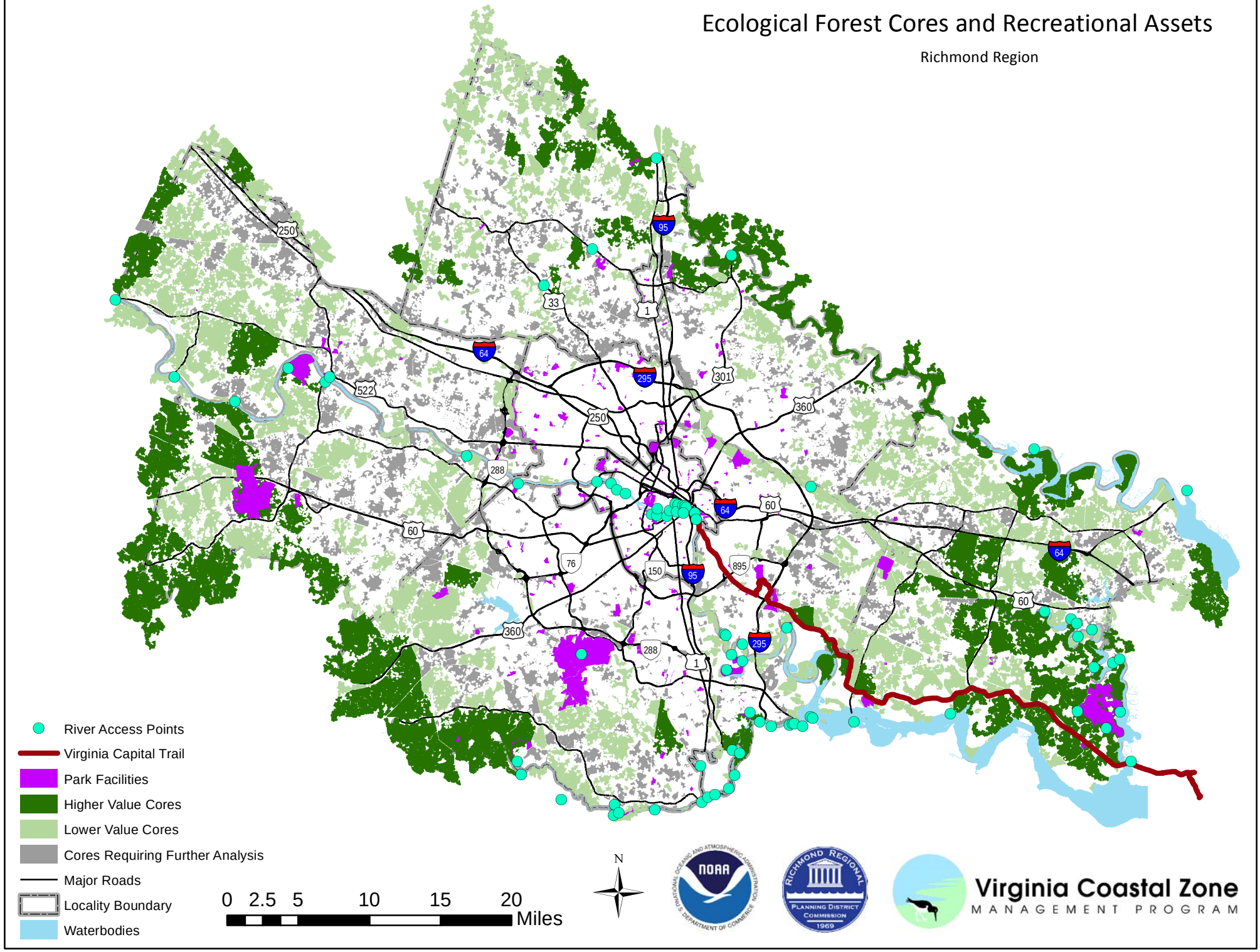
Ecological Forest Cores and Recreational Assets

Richmond Region



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Conclusion

While the Richmond Region has experienced continued loss of ecological forest core land area since 2000, there is still a healthy large-scale network present, especially in rural localities. Protection and expansion of the green infrastructure network is possible, especially when considering the interest in and likely economic development from connections and expansion involving recreational assets. In addition, the water quality benefits of a healthy green infrastructure network would be financial and policy wins given the development of the Chesapeake Bay TMDL.

Future analyses by RRPDC staff in FFY15 will look at the green infrastructure network over time by including studies of land use, land cover, and water quality.

APPENDIX E

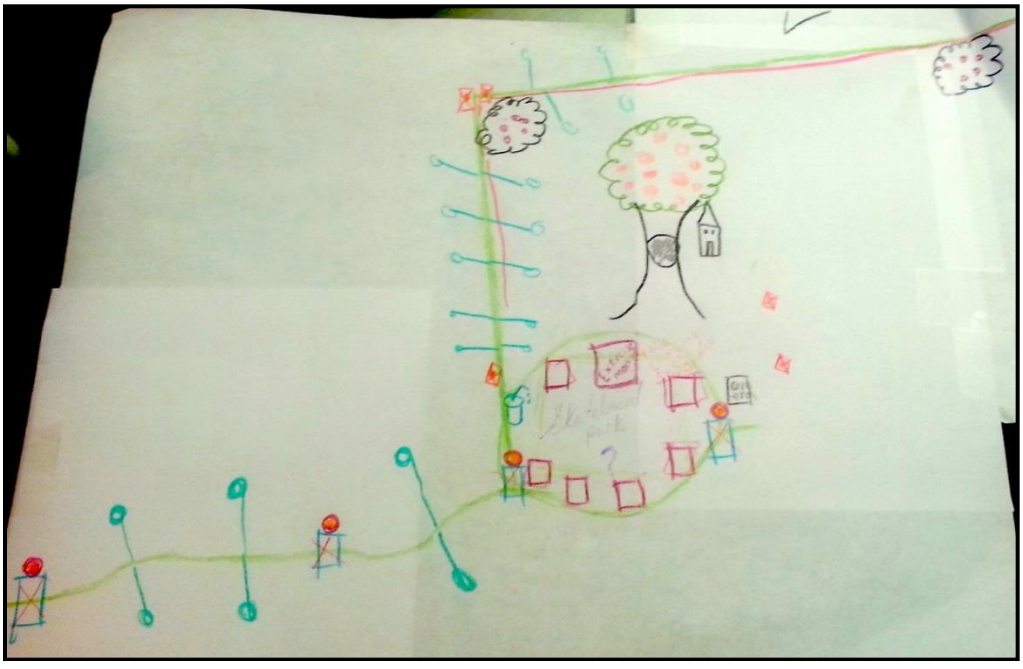
GROUNDWORK RVA

CHANGING PLACES CHANGING LIVES

- *FFY 2014 Projects* -

Cannon Creek Trail

Invasive species removal along Cannon Creek Trail.



Urban Farm at Armstrong High School

North 25th Street Pocket Park