





# Salt Management Strategy (SaMS)

Addressing Chloride Pollution from Winter Salts in Northern Virginia

---

Sarah K. Sivers

Water Permits, Planning and Monitoring Manager

Virginia Department of Environmental Quality

January 17, 2023

# Presentation Overview

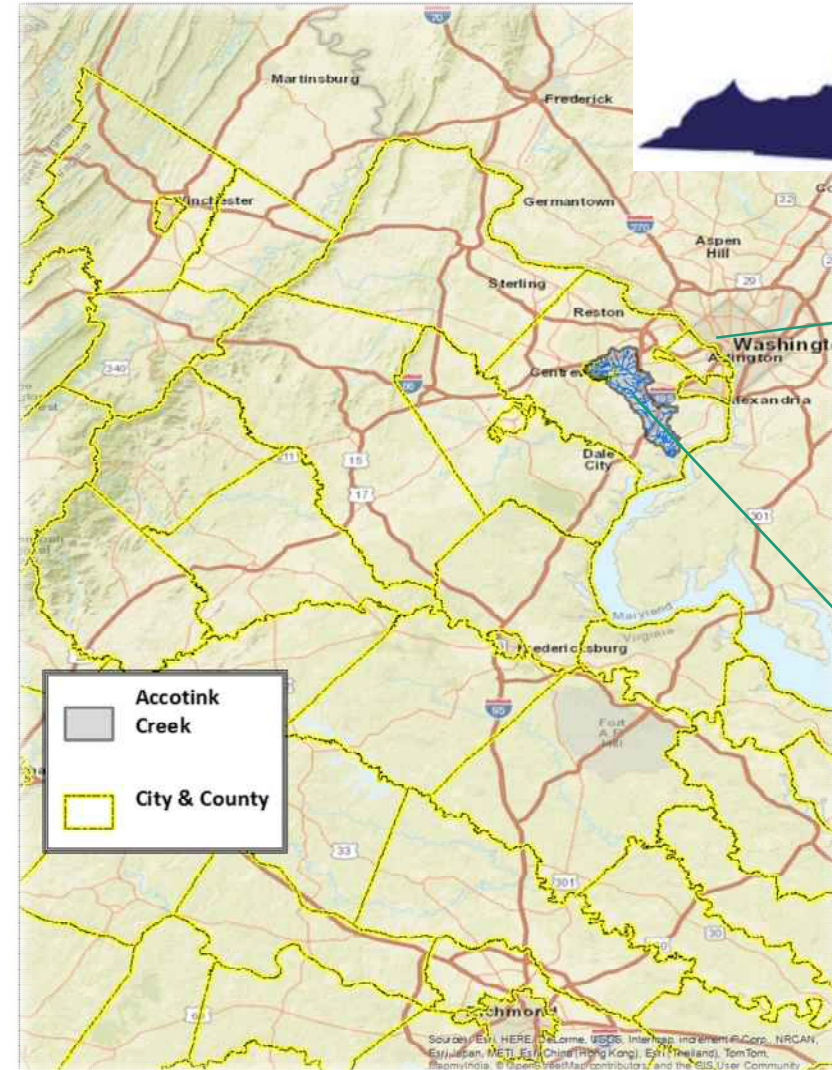
- Chloride Impairments in Virginia
  - Identifying the Source as Winter Salts
  - Challenges with this Pollutant Source
- SaMS Development
  - Framework
  - SaMS Toolkit Overview
- SaMS Moving Forward



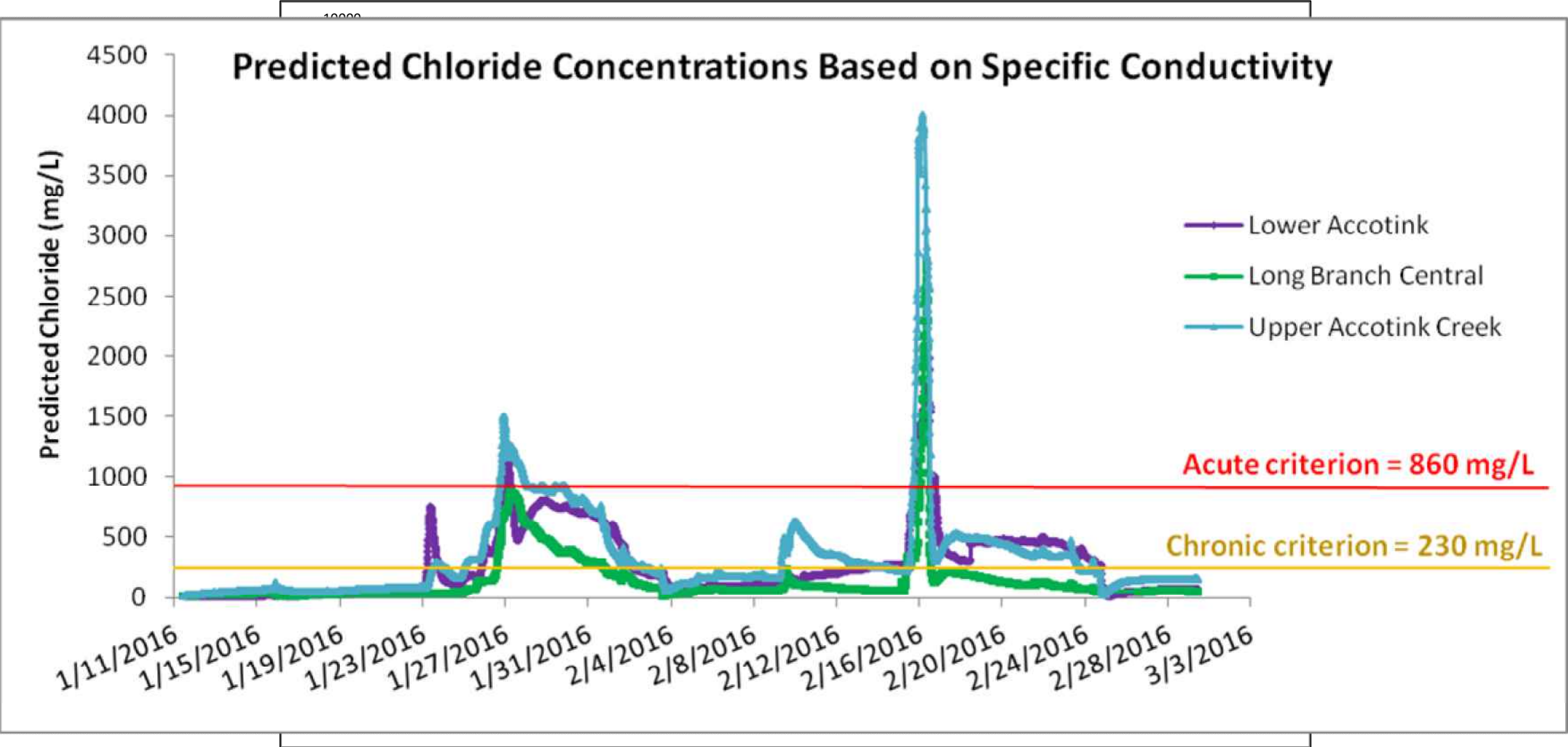
# Virginia's Chloride Impairments

- Majority are associated with mining activities
  - Located in southwest Virginia
  - Several TMDLs developed to address (mostly as TDS)
- Winter salts identified source of pollutant (specifically chloride) in Accotink Creek TMDL
  - Located in northern Virginia
  - First chloride TMDL in VA that addresses this source type

TMDL = Total Maximum Daily Load

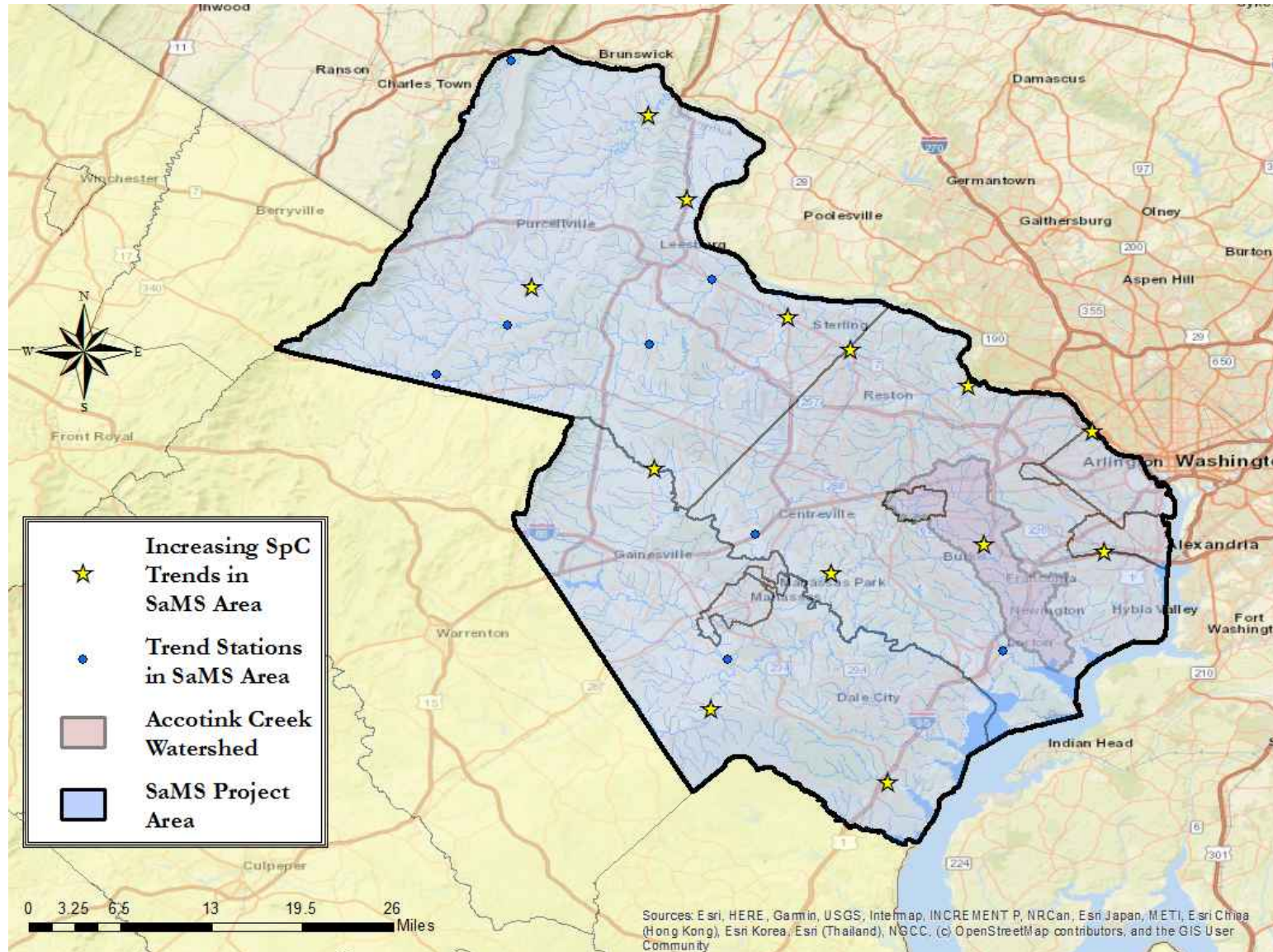


# Finding the Link between Chloride and Winter Storm Events

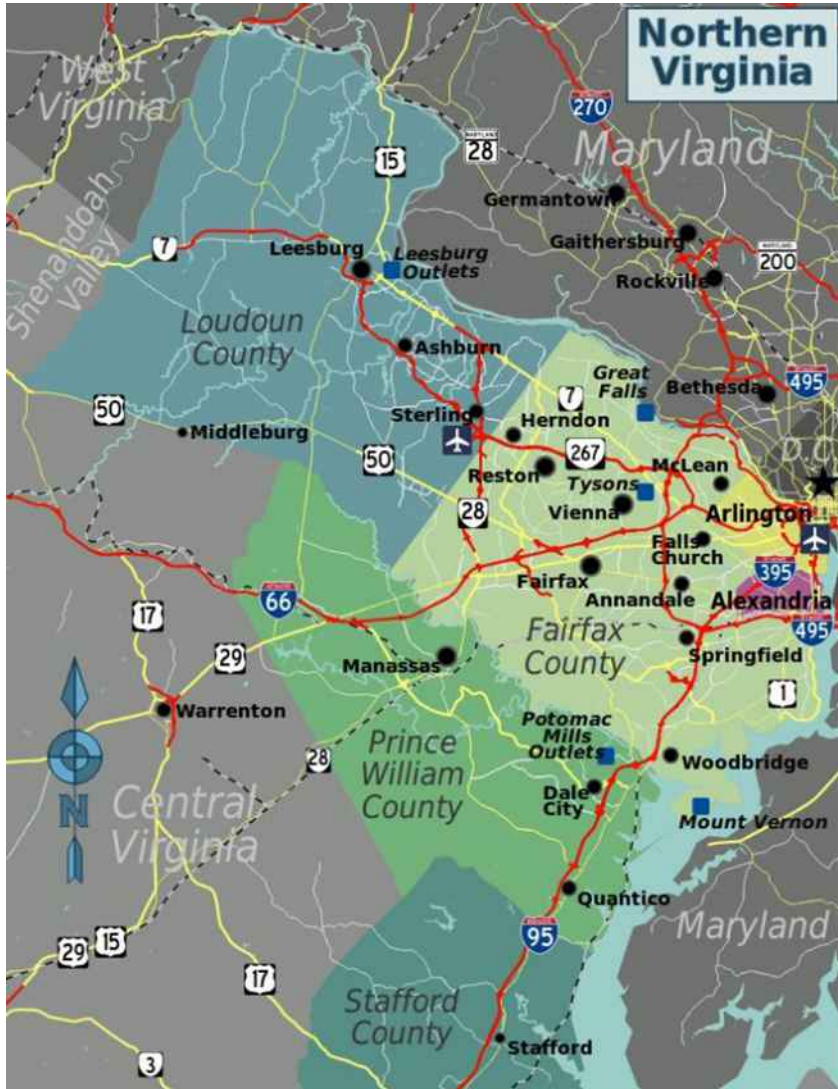




# Increasing Specific Conductance Trends



# Challenges addressing this Source of Chloride

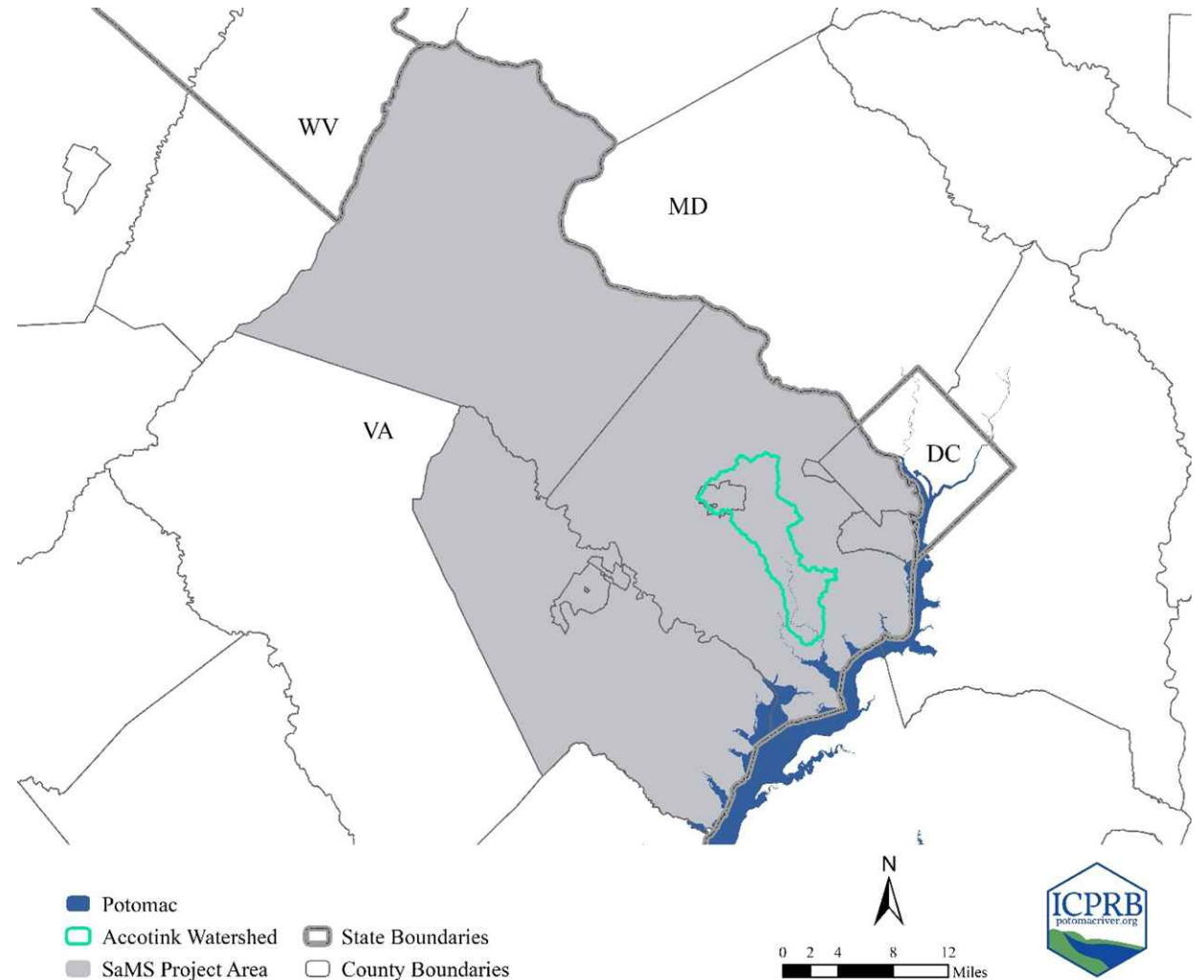


- Use of winter salts critical to maintain public safety and commerce moving.
- Management practices are implemented on a jurisdictional level, not specific to watersheds.
- Northern Virginia is highly urbanized, Accotink Creek's water quality issues are likely present in other watersheds.
- Winter management handled by both private and public sector providers.
- Impression that more salt = higher level of service
- Each winter storm event is unique.



# Salt Management Strategy (SaMS)

- A broad, proactive and voluntary approach to develop solutions to minimize impacts while maintaining public safety in northern Virginia
- A toolkit for multiple audiences
  - Optimize winter practices
  - Raise awareness
  - Monitor efforts
  - Adaptive implementation





# SaMS Goals

The aim of this effort was to develop a strategy for Northern VA, that:

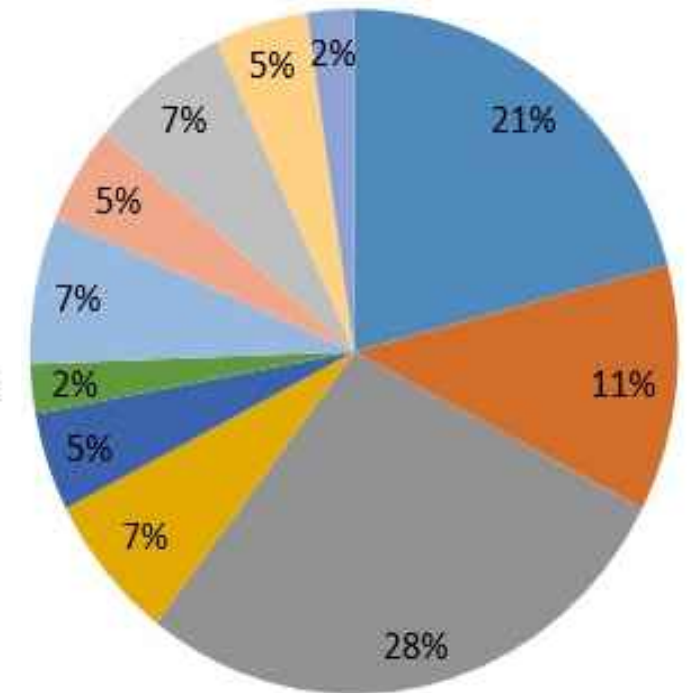
1. Uses a stakeholder-driven process to proactively address salt loads in the region and address the Accotink Creek chloride (salt) TMDLs.
2. Generates increased public awareness that leads to positive behavior changes, and long-term support for the continual improvement of deicing/anti-icing practices and actions.
3. Ensures continued protection of public safety, improves water quality and terrestrial habitat, and lessens the effects of deicing/anti-icing salts on drinking water resources, property and road infrastructure through information sharing and implementation of best practices over time.

# SaMS: Stakeholder-driven Development

- Recommendations collaboratively developed and consensus-driven
- 43 entities represented by 63 individuals
- Participants include: VDOT, VA Dept. of Health, 2 (Two) Water Authorities Water, 9 (Nine) Counties/Cities, local NGOs



**Stakeholder Advisory Committee Representation**  
(by organization)



# SaMS Development Framework

## Stakeholder Advisory Committee (SAC)

- Large stakeholder body
- 4 meetings

## Workgroups

- 6 groups, comprised of SAC members
- 4-5 meetings each

## Steering Committee

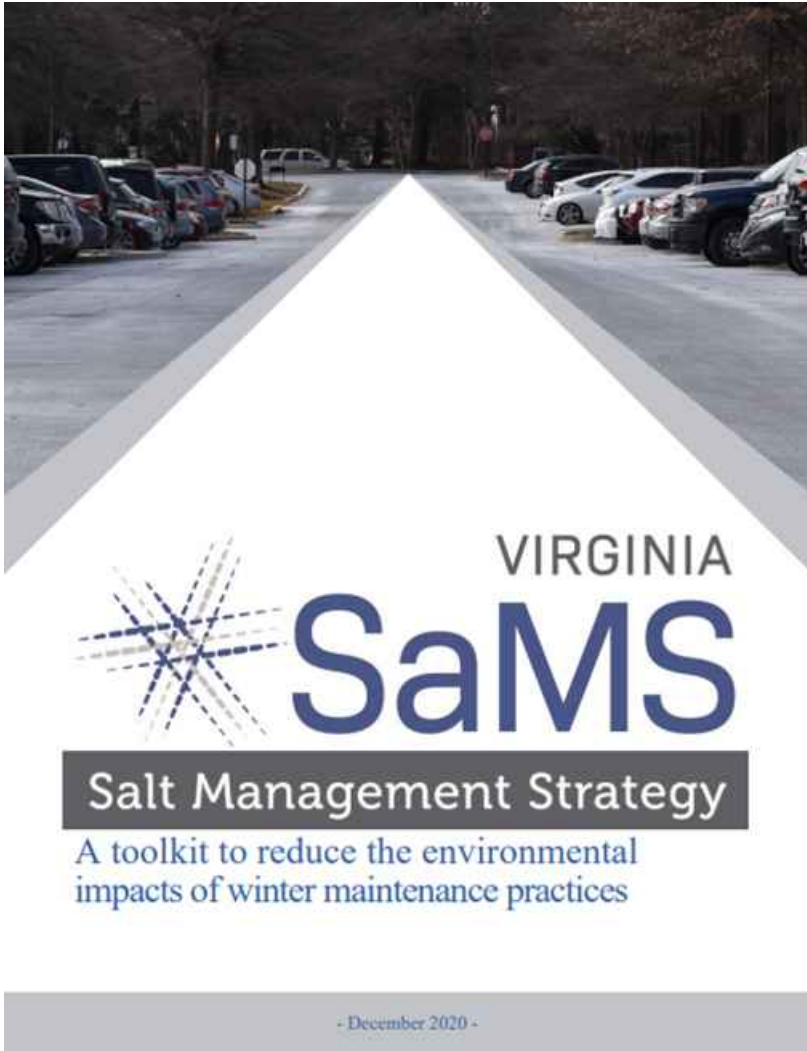
- 1-2 representatives from each workgroup
- 1 meeting

### SaMS Workgroups:

1. Traditional Best Management Practices
2. Non-Traditional Best Practices
3. Education & Outreach
4. Water Quality Monitoring & Research
5. Salt Tracking & Reporting
6. Government Coordination



# SaMS Toolkit: Best Practices and Recommendations



- Comprises winter maintenance best practices and recommendations
- “Toolkit”: Organizations can pick and chose best practices
- Addresses a variety of audiences:
  - Winter maintenance professionals
  - Researchers
  - Water quality monitoring groups
  - Local governments
  - General public
- Resource for voluntary as well as permitting programs
- Available online at <https://www.novaregion.org/1498/SaMS-Toolkit>

# SaMS Toolkit Addresses

## Traditional BMPs

- Presents relative costs and savings for the 50+ different BMPs
- Winter maintenance BMP implementation process
- Application rate evaluation process



## Non-Traditional BMPs

- Evaluation of non-chloride deicers
- Process for piloting new deicers
- Overview of certification/training programs transferable to VA
- Best practices for residents and drivers



# SaMS Toolkit Addresses (cont.)

## Water Quality Monitoring

- Trends in regional specific conductance
- General criteria for a monitoring program
- Pilot project design: Monitoring water quality response to BMP implementation
- Models for predicting chloride concentration
- “Grab-and-Go” resource for existing project area monitoring
- Conceptual model of salt origin, transport and fate





# SaMS Toolkit Addresses (cont.)

## Salt Tracking and Reporting

- Metrics/forms to encourage standardization:
  - BMP Implementation and Effectiveness
  - Salt Product Use
- Short term goal: organizational tracking
- Longer term goal: reporting for regional analysis



## Governmental Coordination

- Public communication on Levels of Service
- Pre and post-season coordination, including communications
- Shared training and other pooled resources opportunities



# SaMS Toolkit Addresses (cont.)

## Education & Outreach

- Pilot outreach campaign (Nov-Dec 2019)
- Baseline awareness survey (Dec 2019)
- SaMS Logo and use policy
- Principles for developing messages and materials
- Media Toolkit: Messages and infographics
- Funding Sources



# SaMS Toolkit: Content Overview

- Planning and Application Practices
- Tracking and Reporting
- Best Practices for the General Public
- Education and Outreach
- Water Quality Monitoring
- Funding Sources and Financial Considerations
- Inter-Governmental Coordination
- Future Recommendations and Research Needs
- Implementation











## Did you know...

Salt applied to paved surfaces during slick weather conditions helps keep us safe, and businesses and vital services open. However, after a snow event, salt residue lingers and impacts:



### Public health:

Affecting those serviced by drinking water supplies with higher salt concentrations.



### Infrastructure:

Corrosion and damage to roads, bridges, sidewalks and parking lots leads to higher maintenance and replacement costs.



### The environment:

Increases in stream and groundwater salinity impact freshwater fish and other aquatic life.

# VIRGINIA SaMS

## Salt Management Strategy WINTER SALT SMART

**Help Virginia be Winter Salt Smart**

Follow these winter safety tips to give snowplows the room and time to operate, allowing roads to get cleared more efficiently with appropriate salt application:



Stay home, avoid non-essential travel and telework if possible.



Plan travel times to avoid driving during and immediately after a storm.



If you *must* go out, take public transportation.



Wait to drive until road conditions improve.



Monitor weather closely, as forecasts can change quickly.



## What to do during and after a storm?



Clear snow by shoveling early and often, and apply salt only where needed.



If the sun comes out and you can wait, let the sun do some of the work before you apply salt.

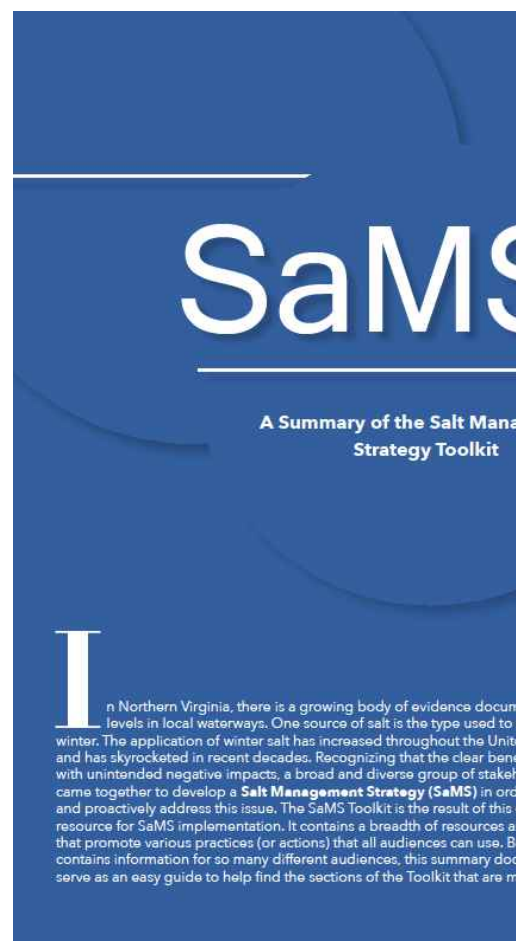


Apply salt after clearing snow. Never use salt to "burn off" snow. It will quickly dilute and requires more salt.



After the storm, sweep up the extra salt or traction material and use it again next time.

# Digging into SaMS for the first time



## QUICK VIEW SECTION 4 AUDIENCES BY SECTION TRACKING & REPORTING

AUDIENCE	SECTIONS OF THE SAMS TOOLKIT										
	1	2	3	4	5	6	7	8	9	10	11
Winter Maintenance Professionals	•	•	•	•					•	•	•
Businesses	•	•	•	•					•	•	•
Other Groups, Contracting Services	•	•	•	•					•	•	•
Non-govt Organizations	•	•	•		•	•			•	•	•
Researchers	•	•	•	•			•		•	•	•
Water Monitoring Groups	•	•	•				•		•	•	•
Elected Officials & Local Leaders	•	•	•	•	•	•	•	•	•	•	•
HOAs	•	•	•	•	•	•			•	•	•
Drinking Water Providers	•	•	•	•	•	•	•	•	•	•	•
Commissions & Councils	•	•	•	•	•	•	•	•	•	•	•
Governments	•	•	•	•	•	•	•	•	•	•	•
General Public	•	•	•		•	•			•	•	•



### APPLICABLE AUDIENCES

#### PRIMARY



#### SECONDARY



### What is covered in this section:

- Background information on the Salt Use Tracking and Best Management Practice Implementation Tracking forms included in Appendix J that are flexible to suit any scale of reporting or type and size of winter maintenance organization.
- Information on the various levels of detail that an organization can use to track salt use and helpful concepts to consider when tracking that information.
- Links between the BMP Implementation tracking form and recommendations from Section 3 Planning and Application Practices.
- A discussion of the importance of consistency in winter maintenance tracking of salt and BMP use and future plans to consider regional analyses of this information to track progress and facilitate peer learning.

# How Can SaMS be Useful?

- SaMS is a **resource** for interested individuals/entities to:
  - **Develop** and **implement** a winter maintenance plan and suite of best management practices
  - **Identify** opportunities to improve levels of service and reduce winter operations costs.
  - **Make** informed budget decisions about enhanced winter operations equipment
  - **Calculate** optimized salt application rates and **evaluate** how closely actual operations achieve goals



# SaMS Going Forward

- SaMS completed February 2021, concluding DEQ lead role for development
- Stakeholders lead implementation:
  - Voluntary efforts by all
  - MS4 jurisdictions also have permit conditions/action plans
- Northern Virginia Regional Commission (NVRC) coordinates implementation efforts
- Continued collaboration of stakeholders to:
  - Support private sector training needs
  - Share successes and lessons
  - Periodically revisit and update strategy



# SaMS Contacts

Sarah Sivers

VA Dept. of Environmental Quality

571-408-3157

[Sarah.Sivers@deq.virginia.gov](mailto:Sarah.Sivers@deq.virginia.gov)

Normand Goulet

Northern Virginia Regional Commission

703-642-4634

[NGoulet@novaregion.org](mailto:NGoulet@novaregion.org)

<https://www.novaregion.org/1498/SaMS-Toolkit>

<https://www.novaregion.org/1399/Northern-Virginia-Salt-Management-Strate>

