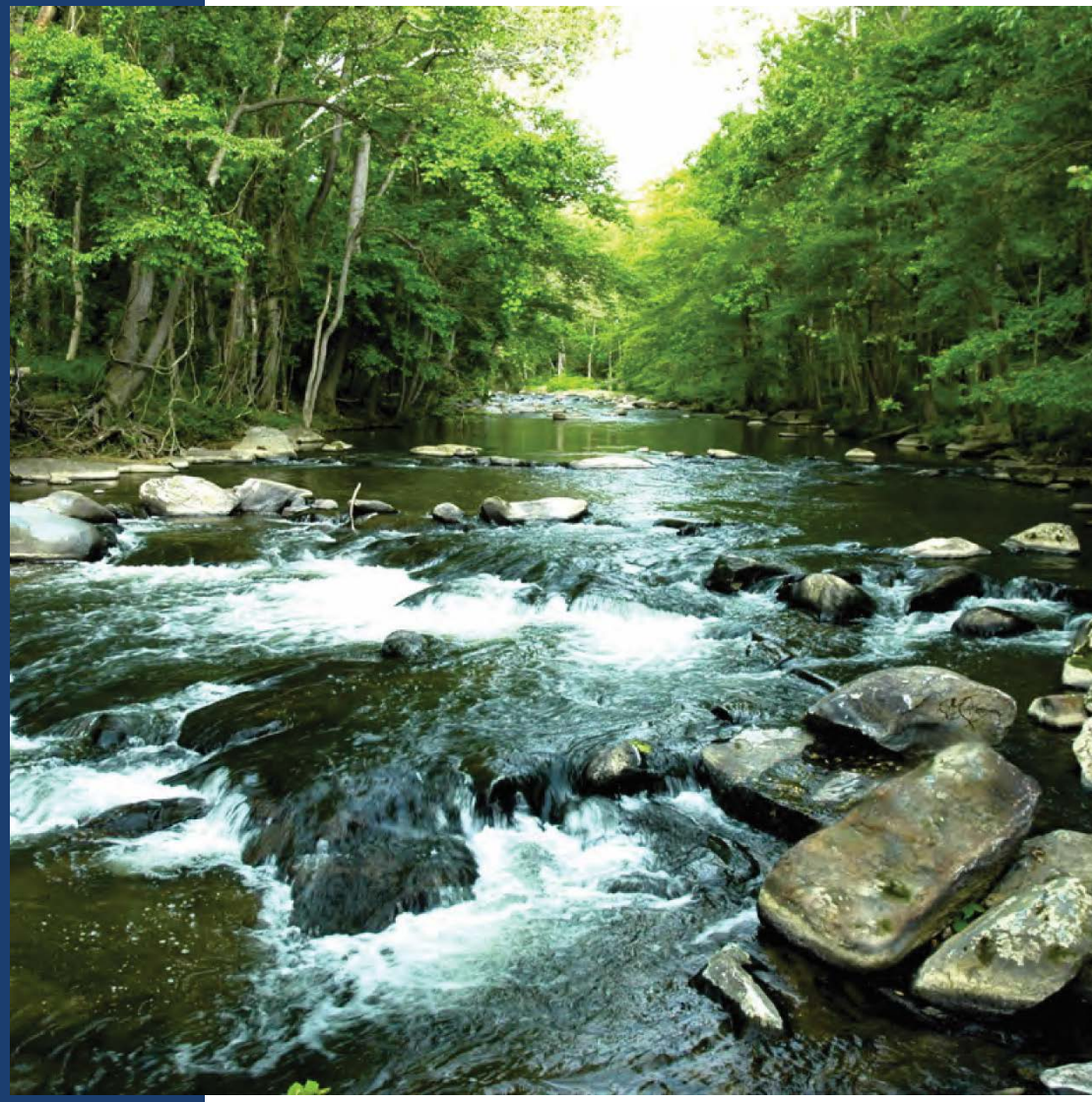
STROUD
WATER RESEARCH CENTER

Stroud Water Research Center advances knowledge and stewardship of freshwater systems through global research, education, and watershed restoration.



STROUD
WATER RESEARCH CENTER

We produce the trusted science needed for successful stream and river conservation…

STROUD
WATER RESEARCH CENTER

…while fostering people's passion for the water in their lives.

How CW-CESU has benefitted us

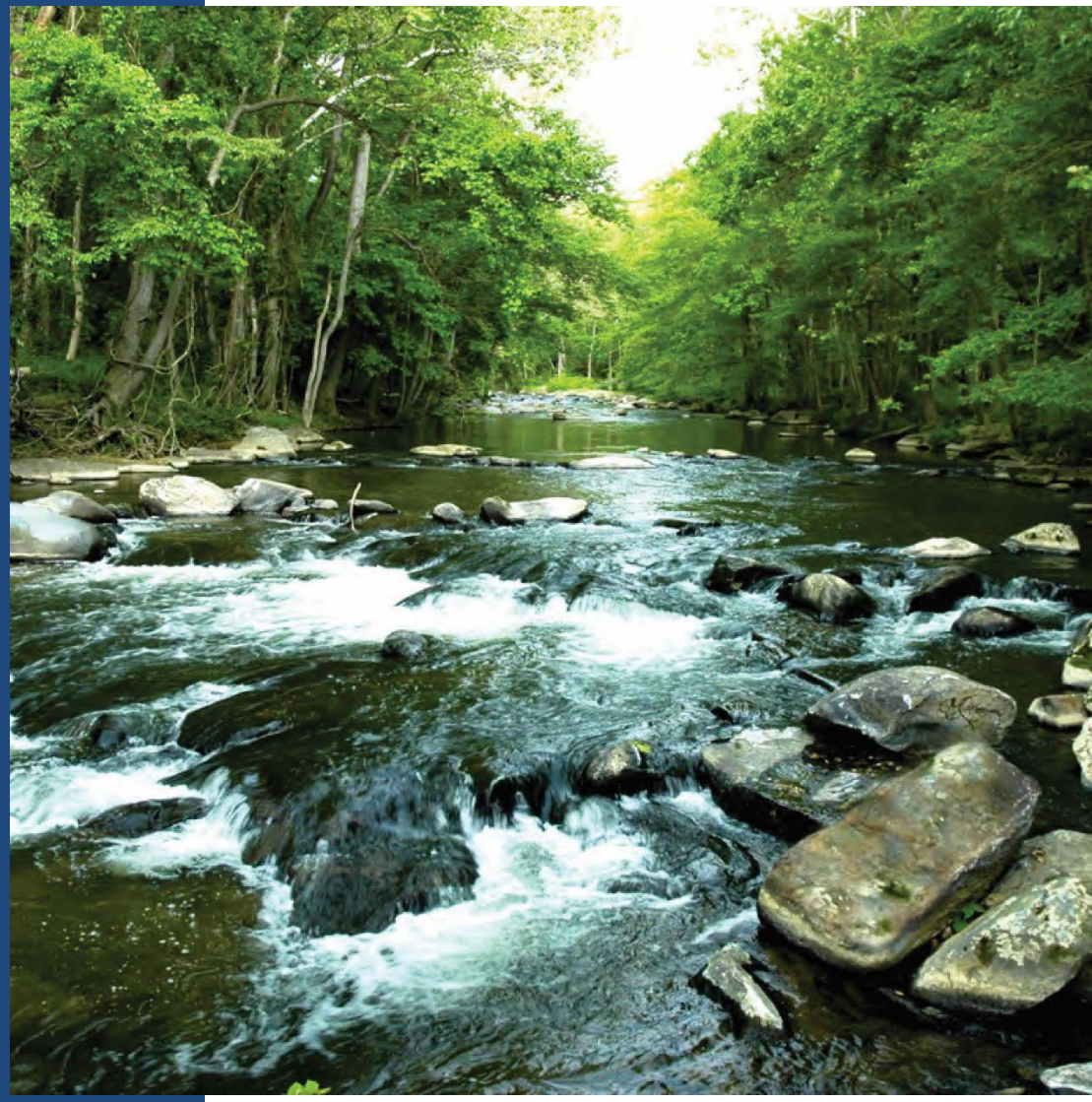
- **Ongoing collaborations**
  - Fish and stream habitat studies
  - Watershed education audit
  - Water quality studies
  - Data quality controls
  - Protocol development
  - Analysis & communication
- **Products**
  - Data quality controls & updated protocol
  - Support for 10+ scientists, educators, & interns
  - 4 conference presentations
  - 4 peer-reviewed journal manuscripts in writing
  - 1 Annual report feature
  - 4 science communication pieces
  - Professional development for young scientists
  - Further collaborations (NASA DEVELOP)
  - Informing resource management
  - And many more!

STROUD
WATER RESEARCH CENTER

Investigations of freshwater salinization in National Capital Region park streams

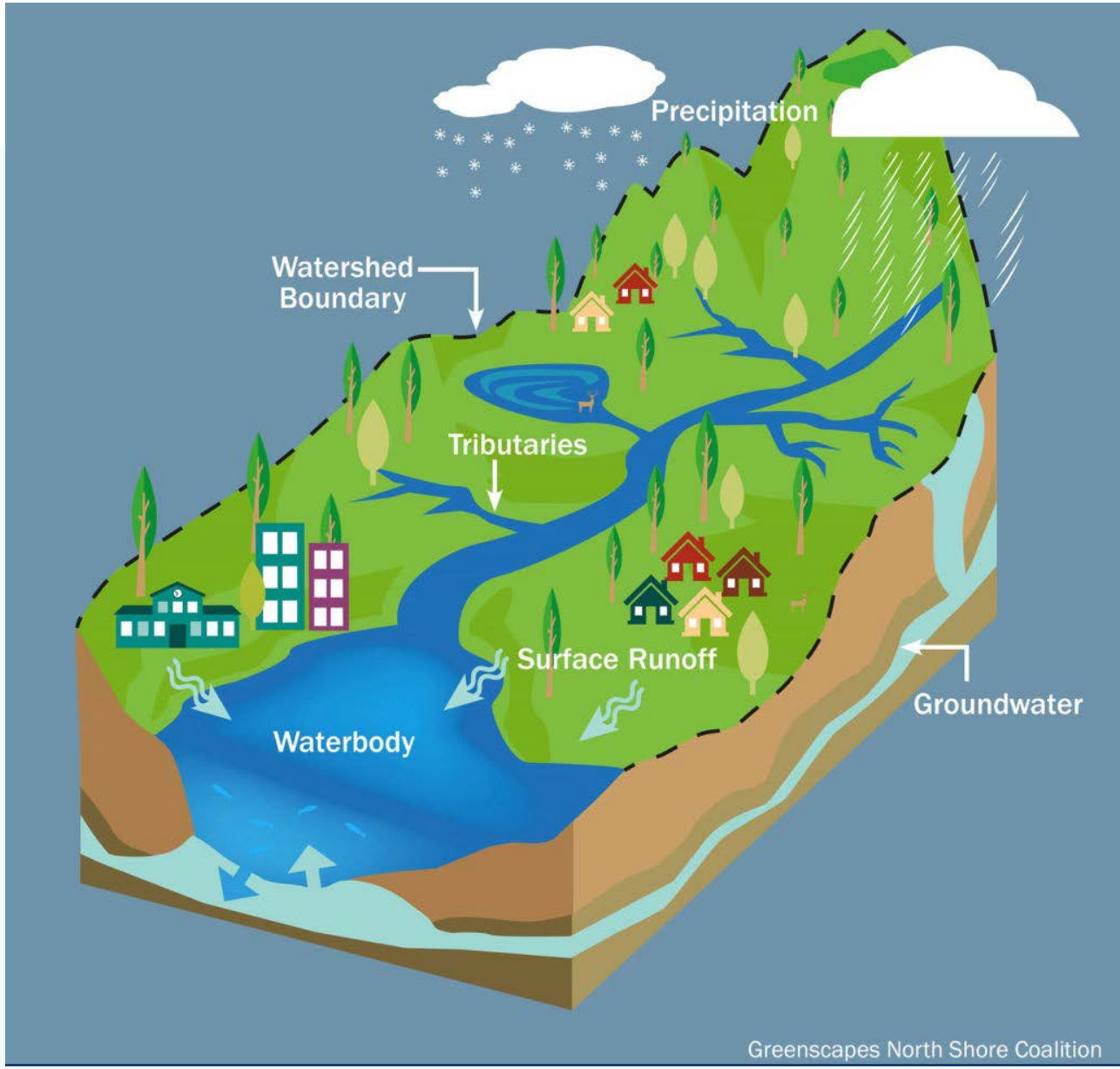
CW-CESU 2024 Annual Meeting

Dan Myers, Lindsay Ashley, Andrejs Brolis, Charles Wainright, John Paul Schmit, Elizabeth Matthews, Galen Oettel, Nicholas Tait, Vicki Lee, David Jones, Diana Oviedo-Vargas, and Scott Ensign | July 2024



Background

- **What happens in the watershed affects the water quality in the stream**



Background

- **Freshwater salinization syndrome is degrading stream ecosystems worldwide [1]**
- **“Specific conductance” is a commonly-used indicator of stream salinity**

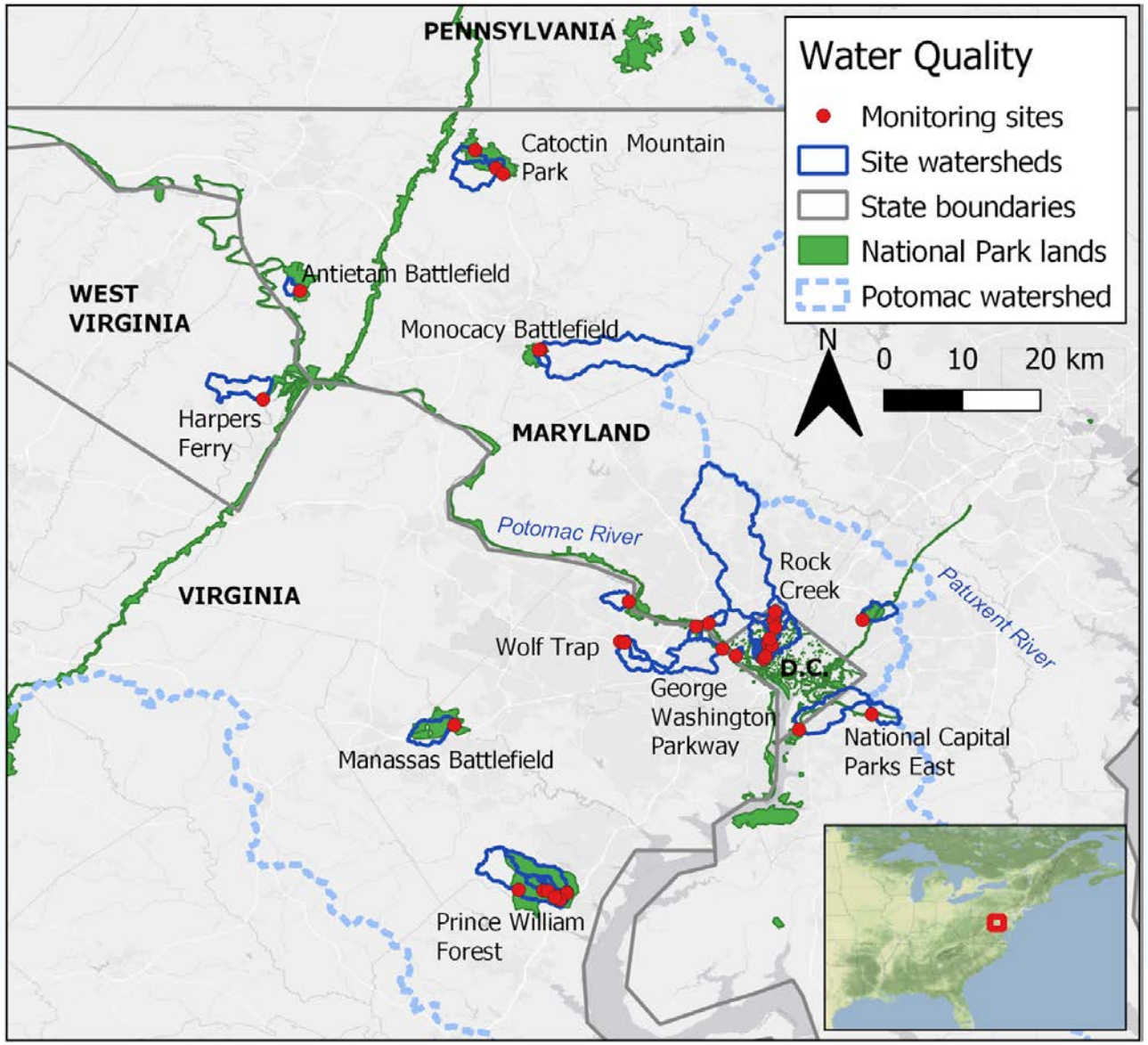
[1] Kaushal et al., 2018 in PNAS

Objective

- **Understand whether or not salinization is a concern for streams of the NCR network**

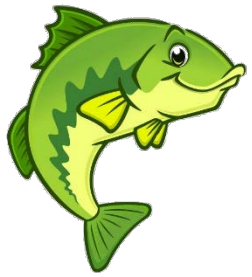
NCR Inventory & Monitoring Network

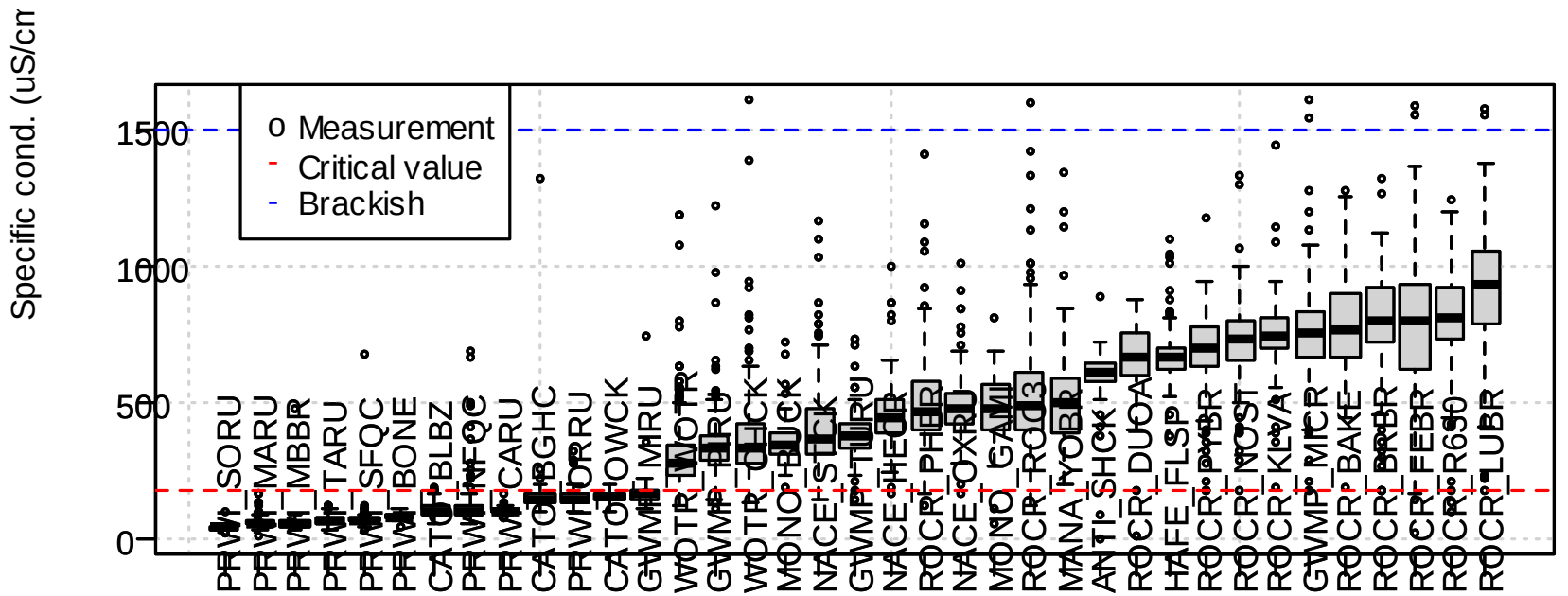
- 10 parks
- 17+ years of discrete water quality samples
- 37 active sites
- Watersheds often extend outside parks
- 12 parameters including specific conductance



Specific conductance

(An indicator of salinity)





Morgan et al., 2007 in *Urban Ecosystems*

Forested/natural parks

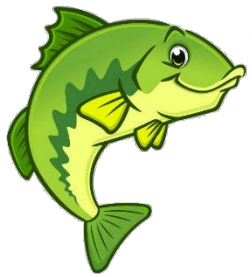
Urban parks

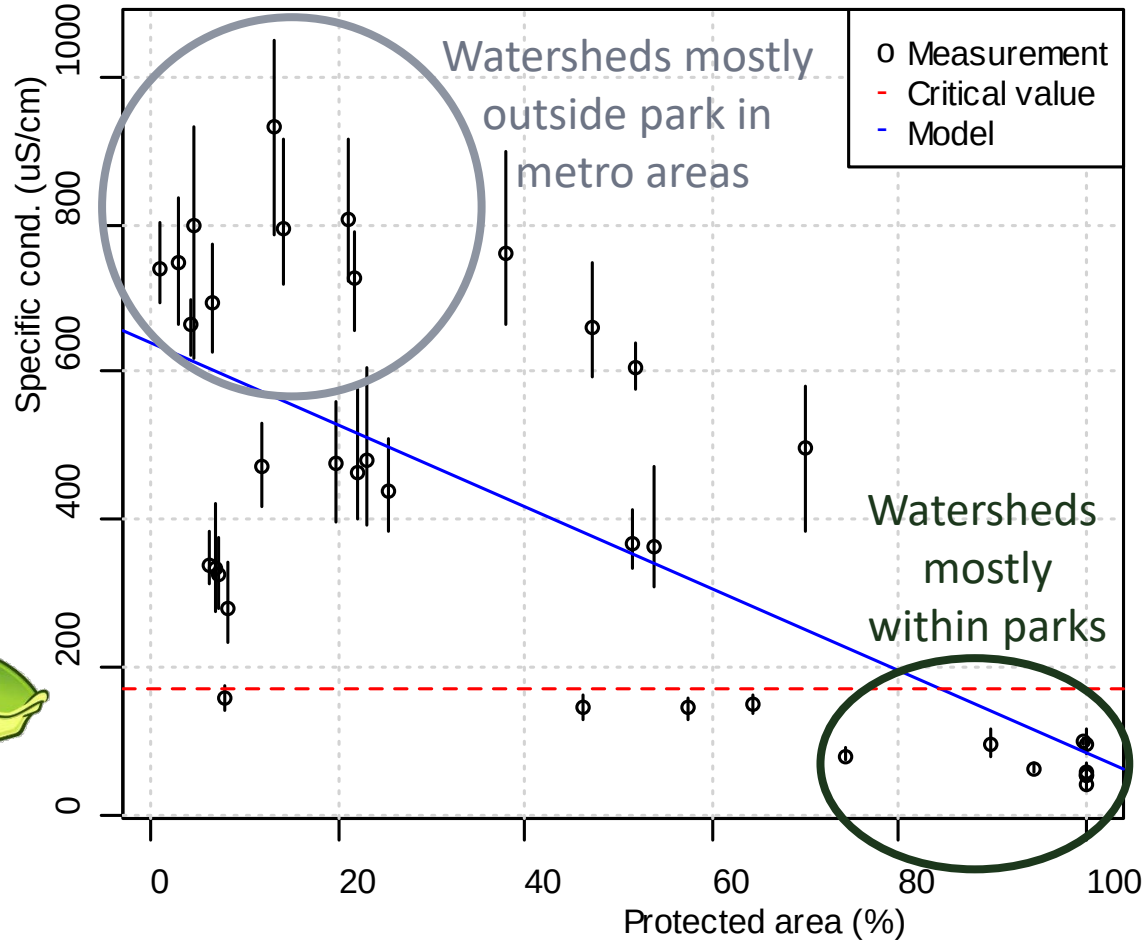
- **A number of streams in the NCRN are experiencing freshwater salinization**

STROUD WATER RESEARCH CENTER

Role of protected areas

- **Watershed in a park? Fine**
- **Watershed extending into metro area? Salty**
- **Parks protect streams**

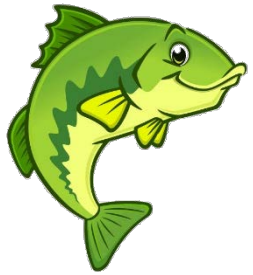


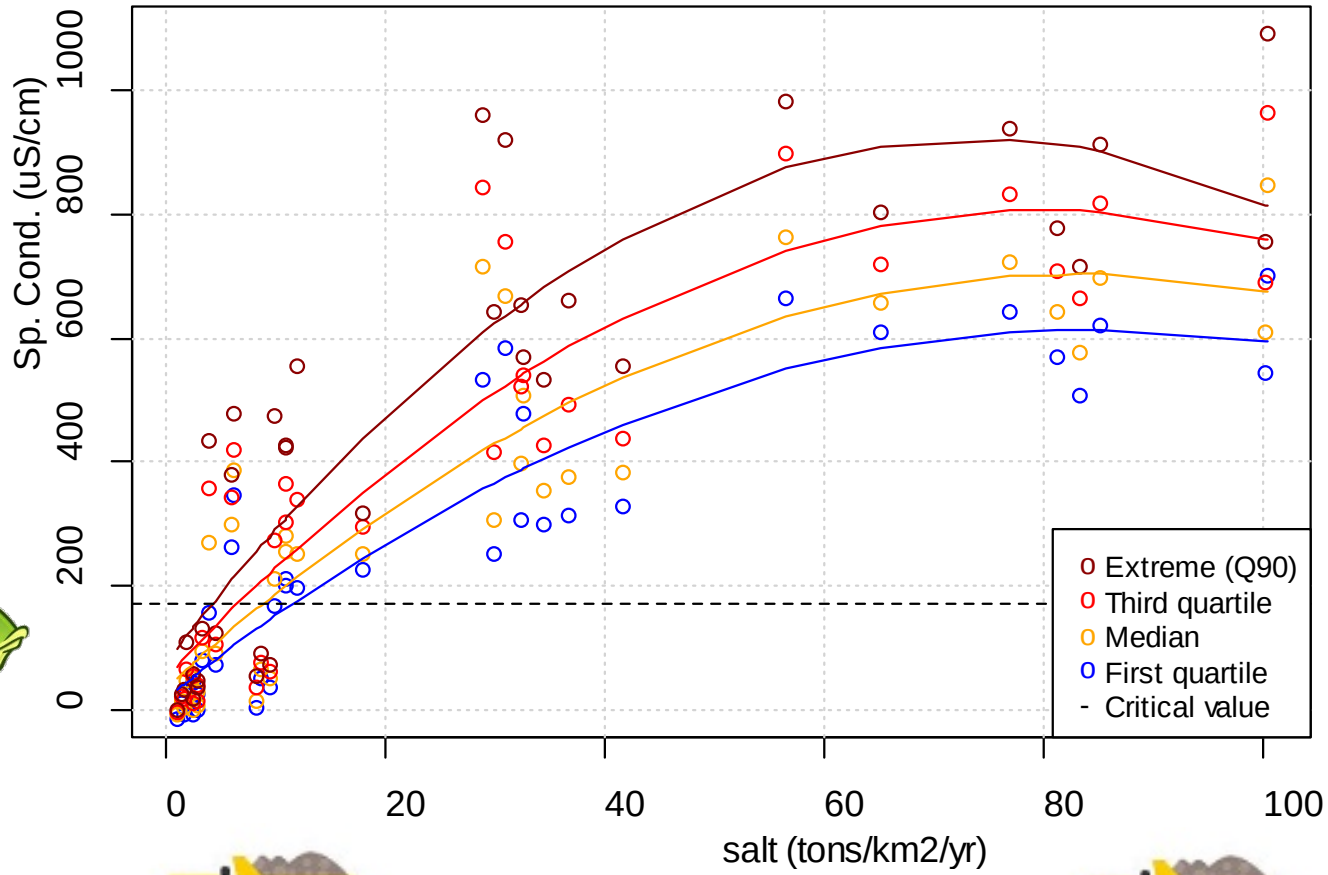


Morgan et al., 2007 in *Urban Ecosystems*

Deicing salt

- **More deicing salt applied in watershed = more stream salinization**





Morgan et al., 2007 in *Urban Ecosystems*

x1

x10

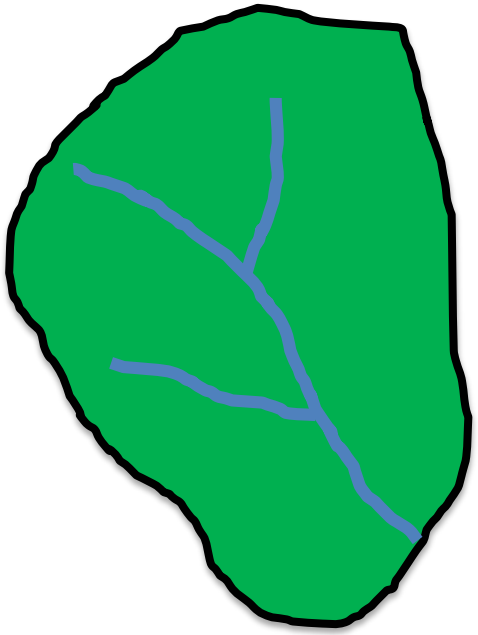
1 dump truck = 10 tons

* Estimates from Falcone et al., 2023 USGS dataset *Estimates of Road Salt Application across the Conterminous United States*

STROUD WATER RESEARCH CENTER

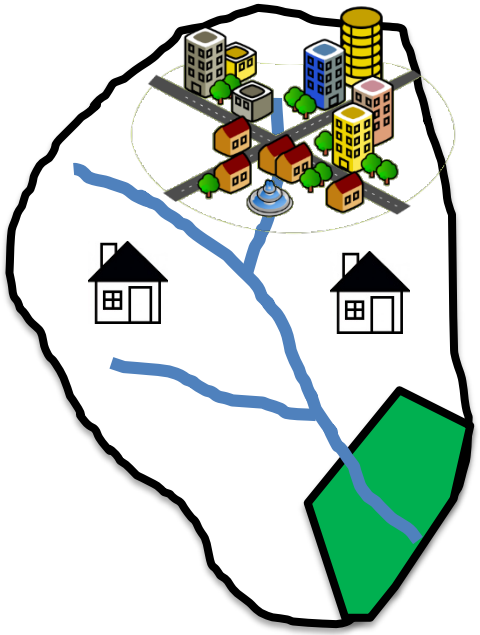
Implications

Watershed mostly within park



Protected from stream salinization

Watershed mostly outside of park



Potential salinization from sources beyond the park

- **Watershed planning with upstream communities is vital to resist salinization**
- **Beyond the National Capital Region too**

Ongoing work

- **Fish, stream habitat, and aquatic invertebrates**
- **NASA satellites**
- **Data quality and protocol**
- **Science communication**

Thank you!

Dan Myers
Postdoctoral Associate
Stroud Water Research Center
dmyers@stroudcenter.org

We acknowledge the **National Capital Region Inventory & Monitoring Network** and **CW-CESU** for this project's funding and data.

STROUD
WATER RESEARCH CENTER