NJ Salt Watch

Engaging Volunteer Scientists in Monitoring Road Salt Impacts

January 22, 2025 | WSSC Road Salt Conference

Photo: NJDEP

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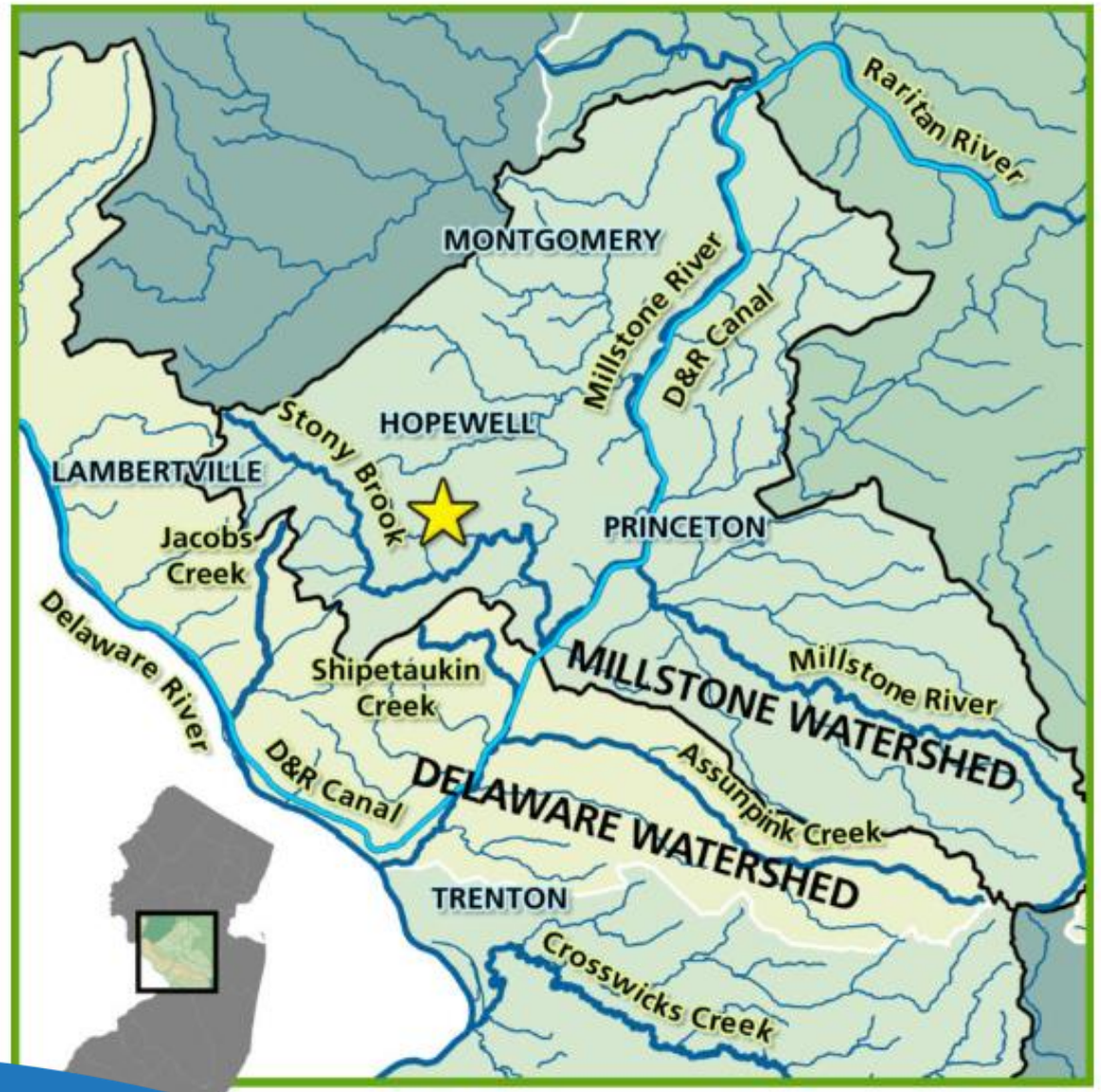
NJ Watershed Watch Network Coordinator

Photo Source: NJDEP

The Watershed Institute

Watershed Center, Pennington, NJ

thewatershed.org



NJ Watershed Watch Network

NEW JERSEY WATERSHED WATCH NETWORK

Hosted/Managed By:

Nonprofit

The Watershed Institute

Funded By:

State Government

DEPARTMENT OF ENVIRONMENTAL PROTECTION · NEW JERSEY

Serving:

Around 55 groups

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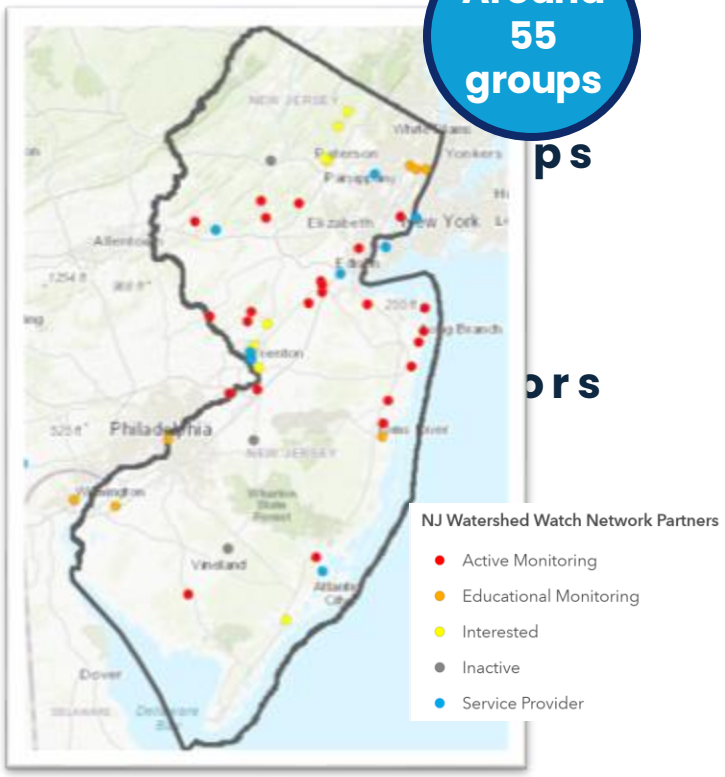
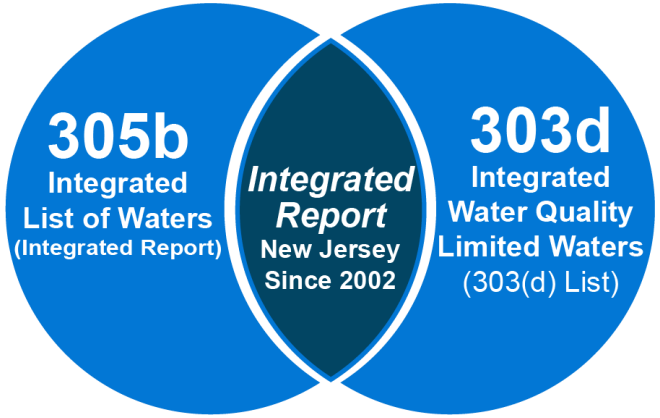
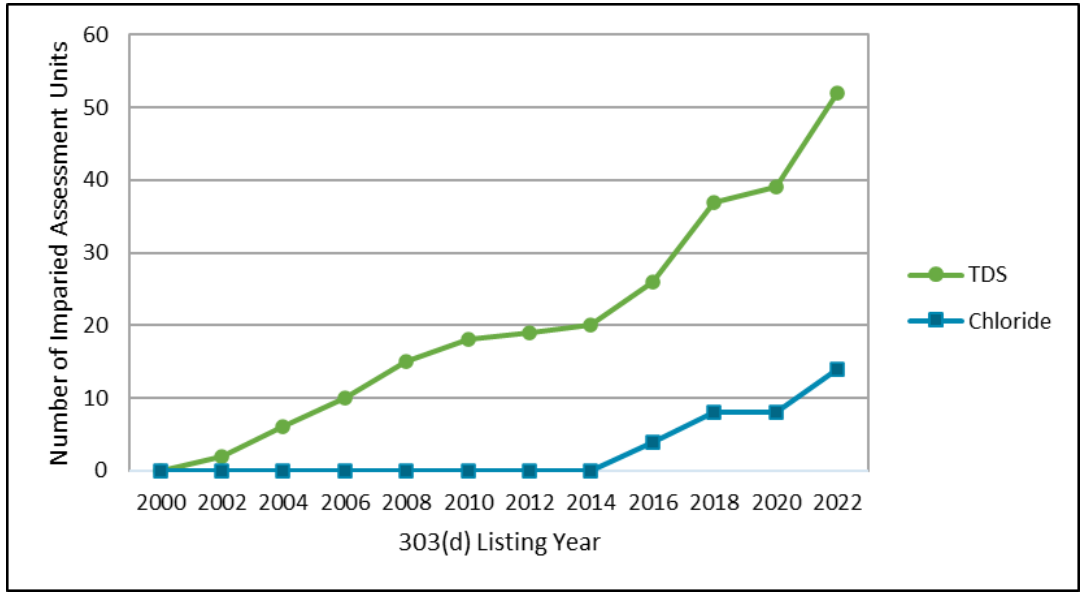


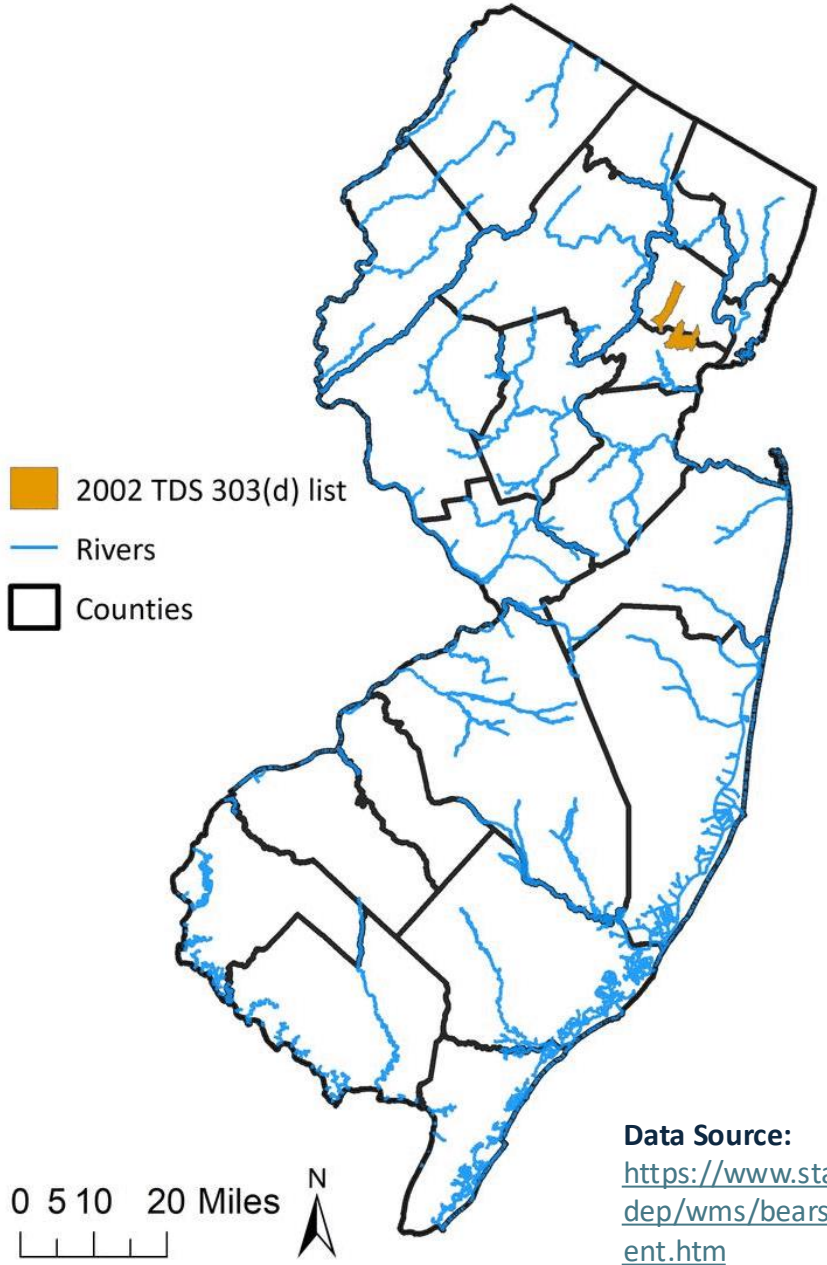


Main Goal: Increase the volume of non-agency data of a "known and sufficient" quality to supplement agency data and be included in regulatory assessments

NJDEP Integrated Report:
Waters Impaired by High TDS and Chloride

- Biennial Integrated Report
  - Exceedances of TDS began in 2002
  - Exceedances of chloride began in 2016
  - Increasing # exceedances over time
  - **Median chloride levels have tripled since 1997**
- 2020 303(d) list of impaired water bodies
  - 39 subwatersheds are impaired by TDS
  - 8 subwatersheds are impaired by chloride





Data Source:
https://www.state.nj.us/dep/wms/bears/assessment.htm

Images: NJDEP

NJ Salt Watch Launched in December 2020

Using Hach chloride test strips based on protocol from **Izaak Walton League's Salt Watch** program

SALT WATCH™
IZAAK WALTON LEAGUE OF AMERICA

What did we need to provide?

- **Simple** procedures that were inclusive for most ages and levels of experience
- **Accessibility** from any location during the pandemic
- **Cost-effective** strategy that maximizes participation

What did we want to receive?

- **Greater geographic and temporal coverage of chloride data** during critical weather periods
- **Increased awareness and sense of ownership** over road salt issues

HOW IT WORKS: Getting Started as a Participant

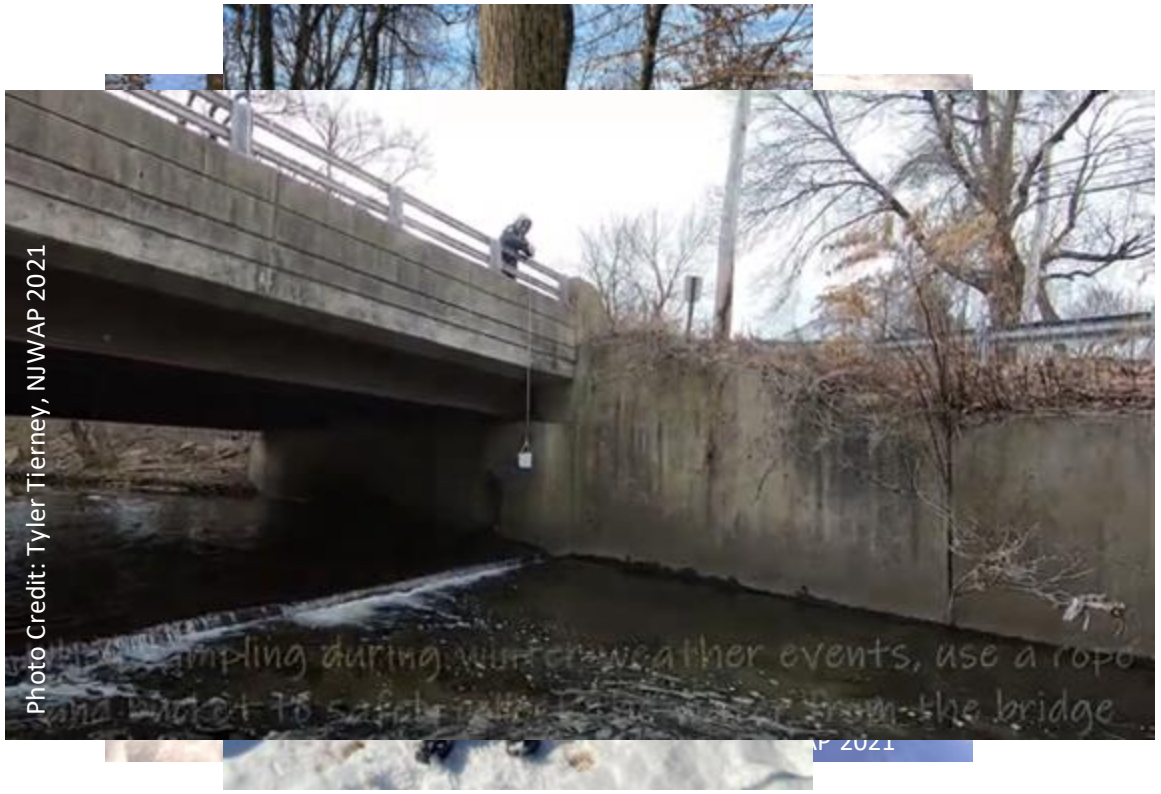
- **Register online** to order an NJ Salt Watch kit to be delivered by mail **njwatershedwatch.org/roadsalt**

- Select any **freshwater** nontidal stream, river, lake, or pond in New Jersey and return **3-6 times between Nov-Apr**

- Pay attention to the weather to collect data **before and after a winter storm/runoff event** (or whenever you can to use up your strips!)

Photo Source: NJ Water Supply Authority

HOW IT WORKS: Sampling and Testing



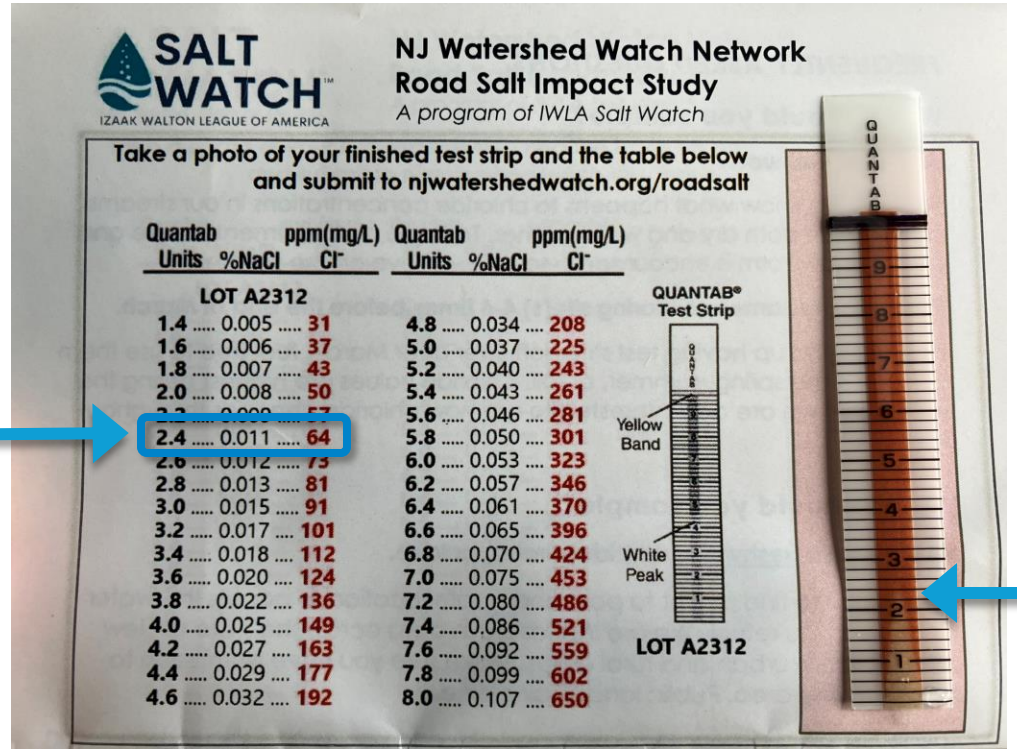
Rinse sampling container and **collect** a water sample

Hach Low Range Chloride Test Strip

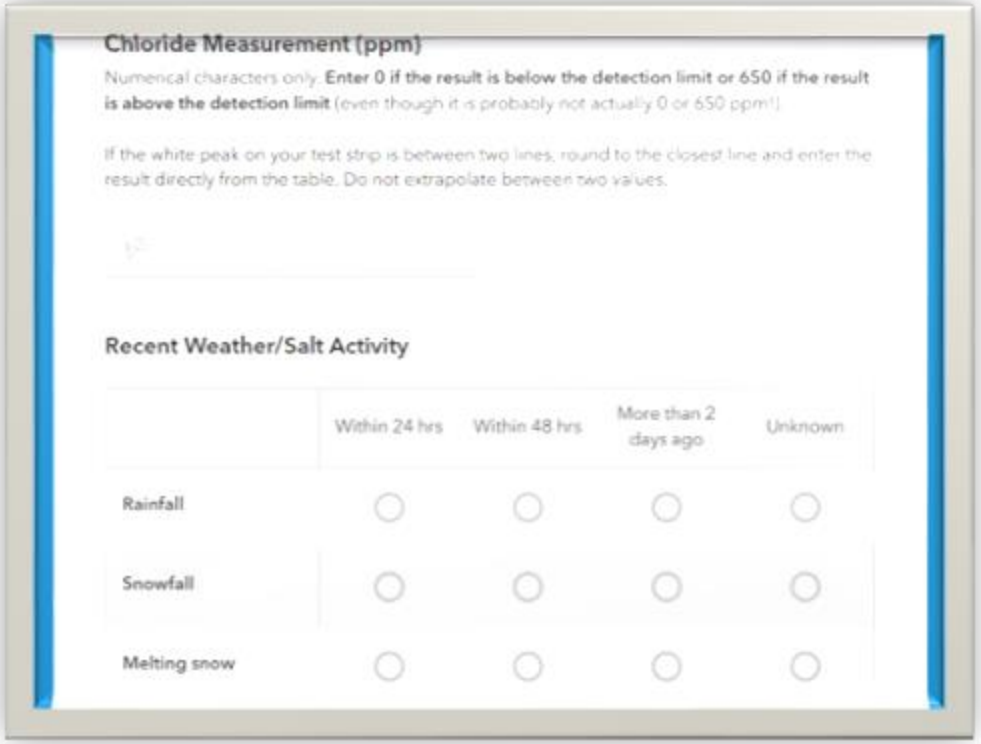
Video Credit: Izaak Walton League of America

Dip the chloride **test strip** into the water until the top strip turns black

HOW IT WORKS: Reading and Entering Data



Reference Quantab unit on the **calibration table** to read the chloride measurement



Record chloride data, location, and weather observations in digital **Survey123 form**

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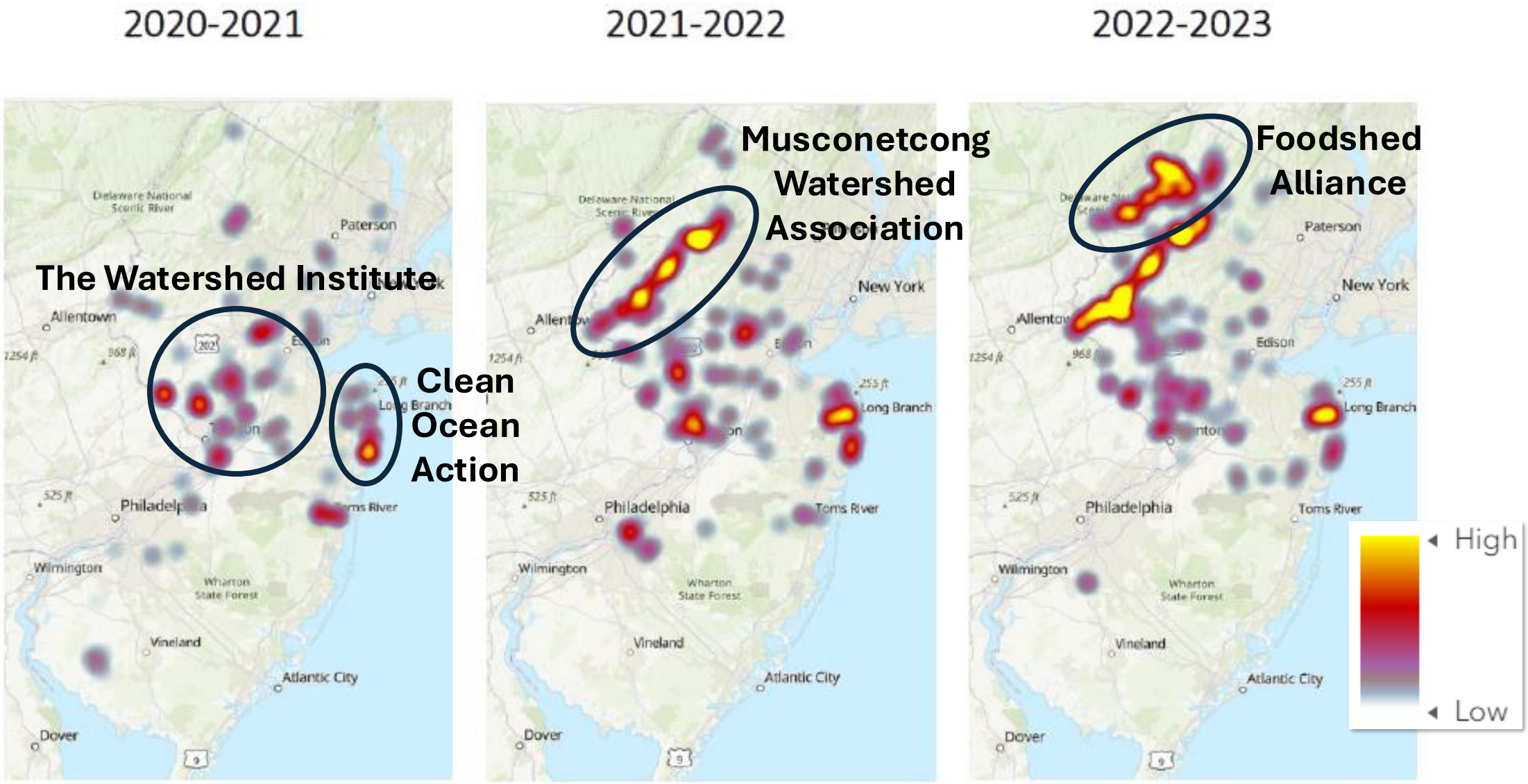
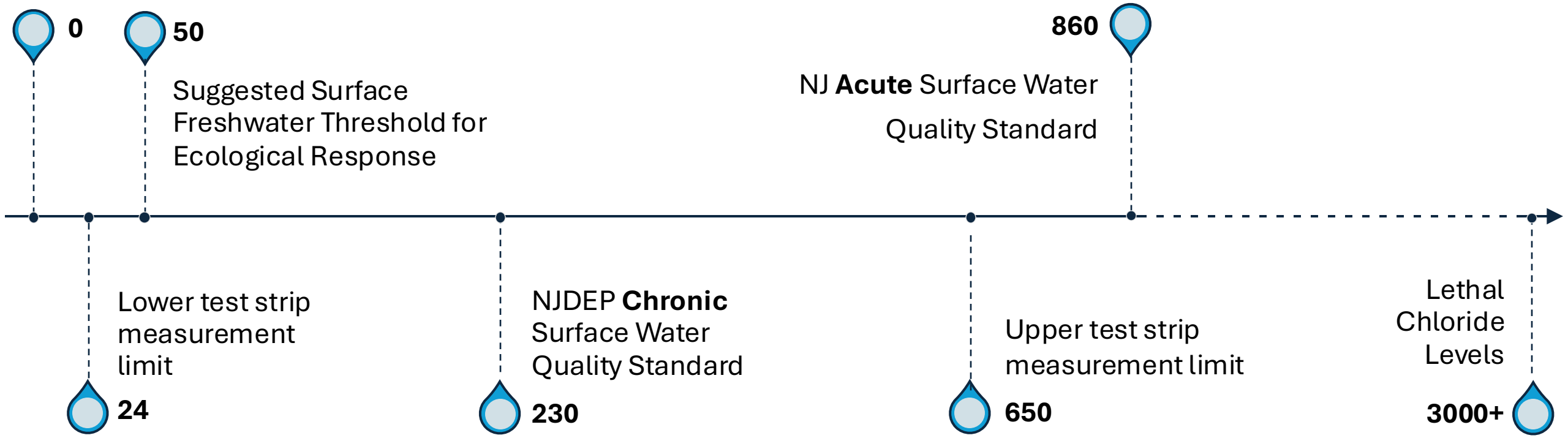
NJ Salt Watch Activity Over Space-Time



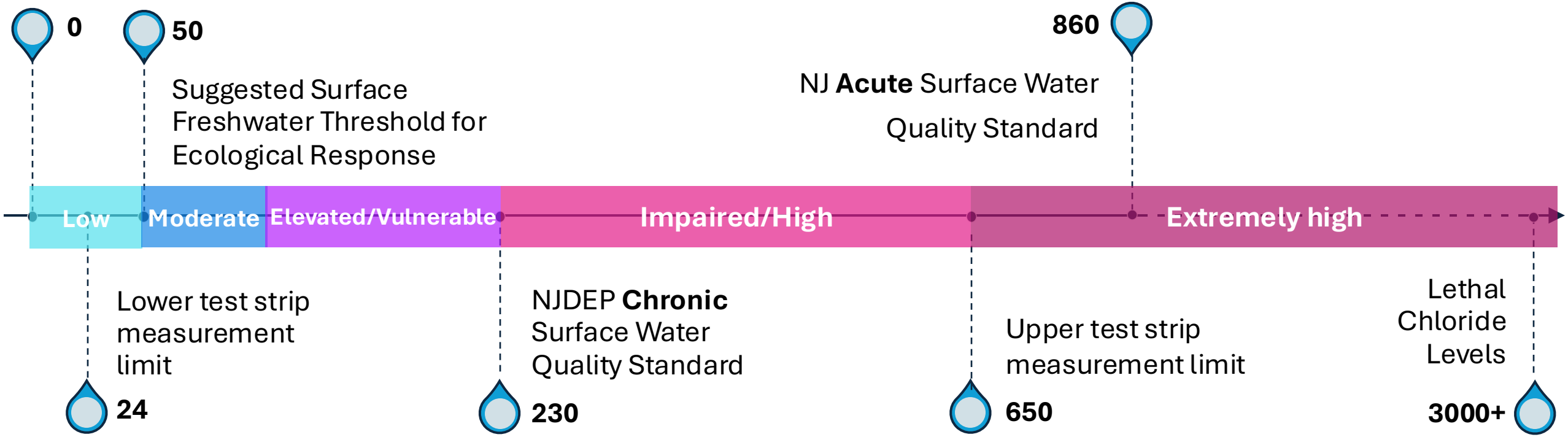
Assessing Freshwater Chloride Levels

NEW JERSEY SURFACE WATER QUALITY STANDARDS

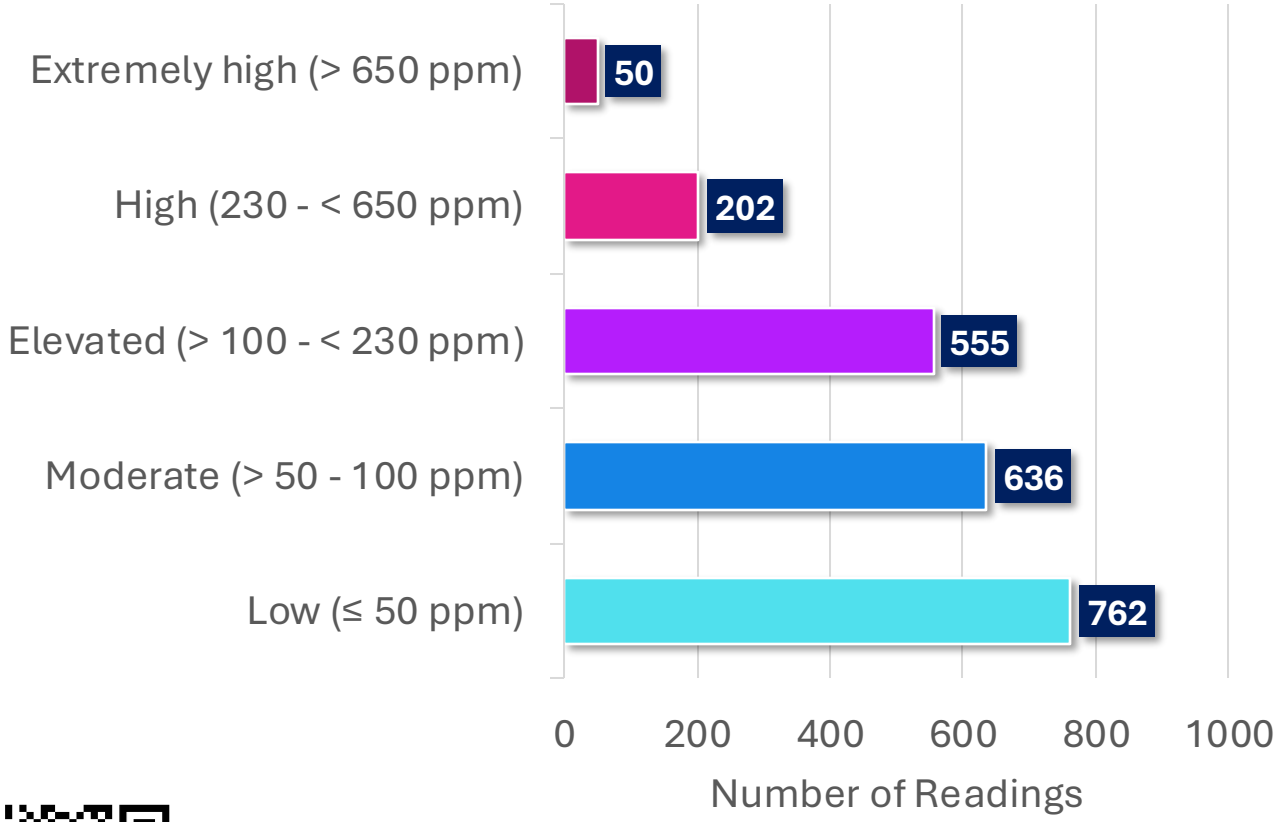


Assessing Freshwater Chloride Levels

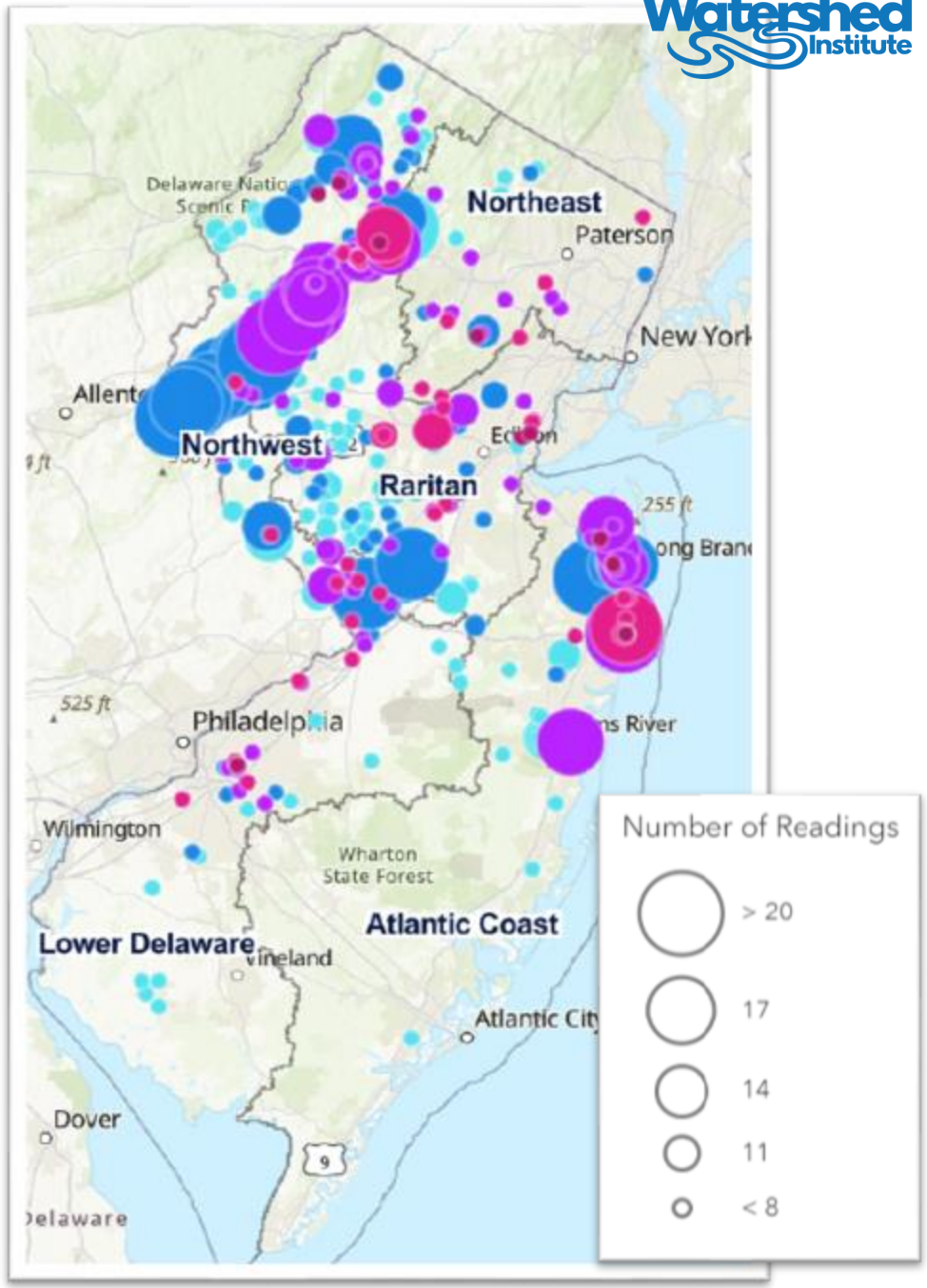
NJ SALT WATCH 5-POINT ASSESSMENT



NJ Salt Watch 2020-2023



Scan here to view the NJ Salt Watch story map



Weather Conditions

Relative Impact to Chloride Concentration

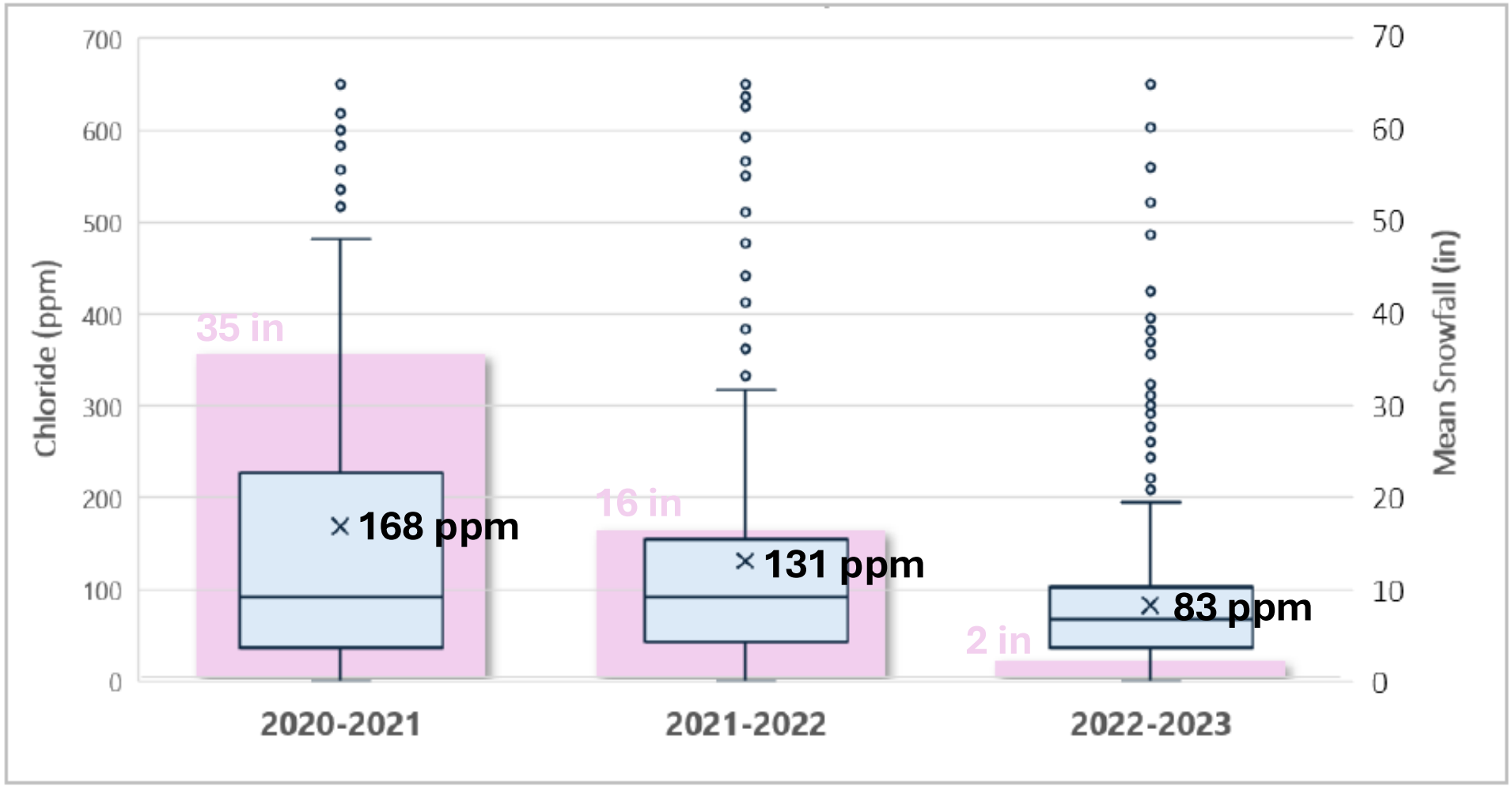
High

Low

		Mean Chloride (ppm)
Snow (n=216)	• Recent road salt application is likely • Initial runoff and scatter of rock salt	**153**
Snowmelt (n=263)	• Aqueous salt drains from roads and sidewalks	**135**
Rain (n=981)	• Rinses away remaining salts • Mobilizes salts in soils • Dilutes chloride concentration	**116**
Dry (n=586)	• Baseline conditions	**100**

NJ Salt Watch

Snowfall and Chloride by Year



Chloride distribution varies with annual snowfall totals

Monthly Variations in Snowfall and Chloride

- Elevated median chloride from Dec to Apr
- Chloride exceedances follow snowfall amounts

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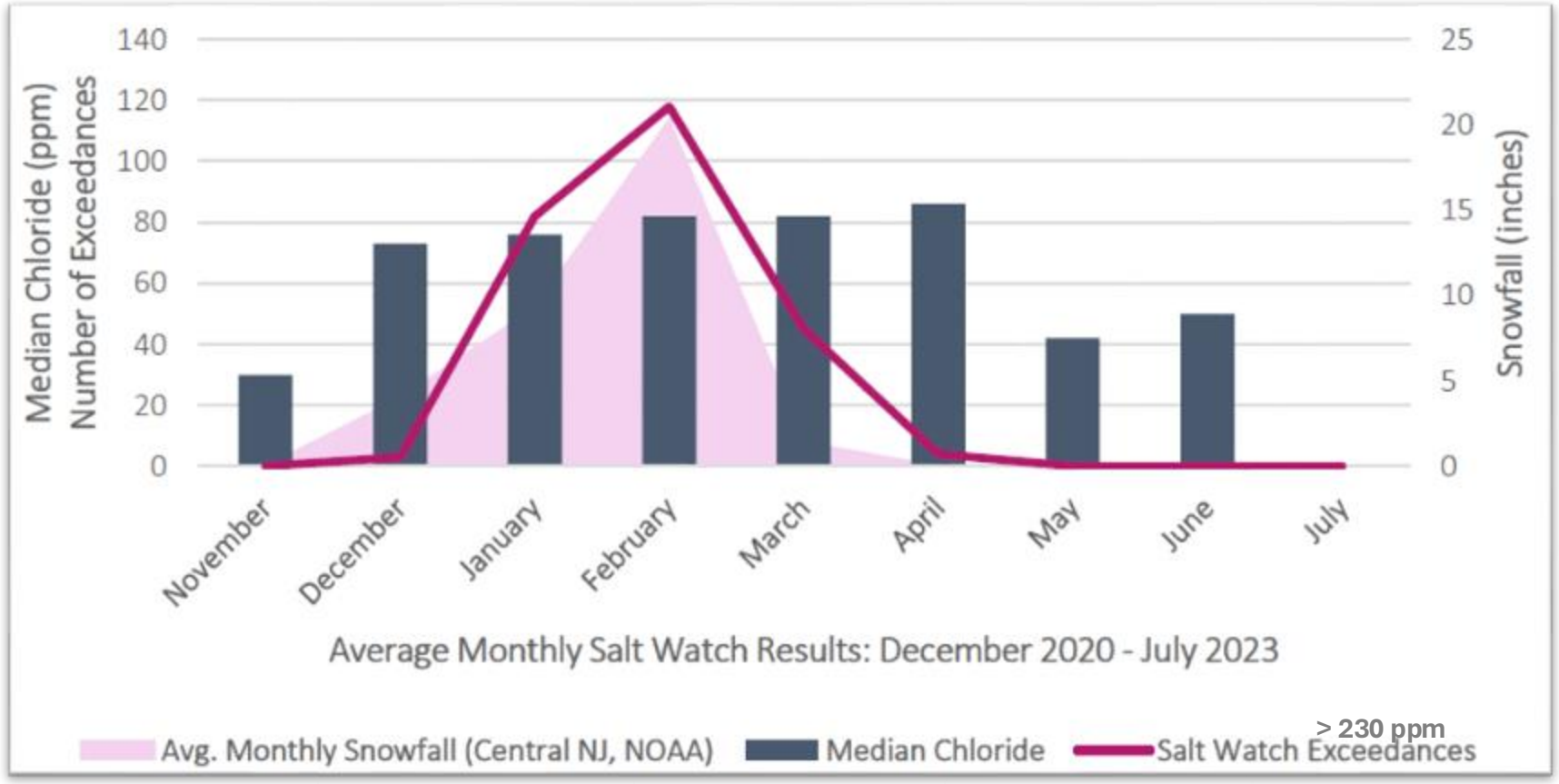
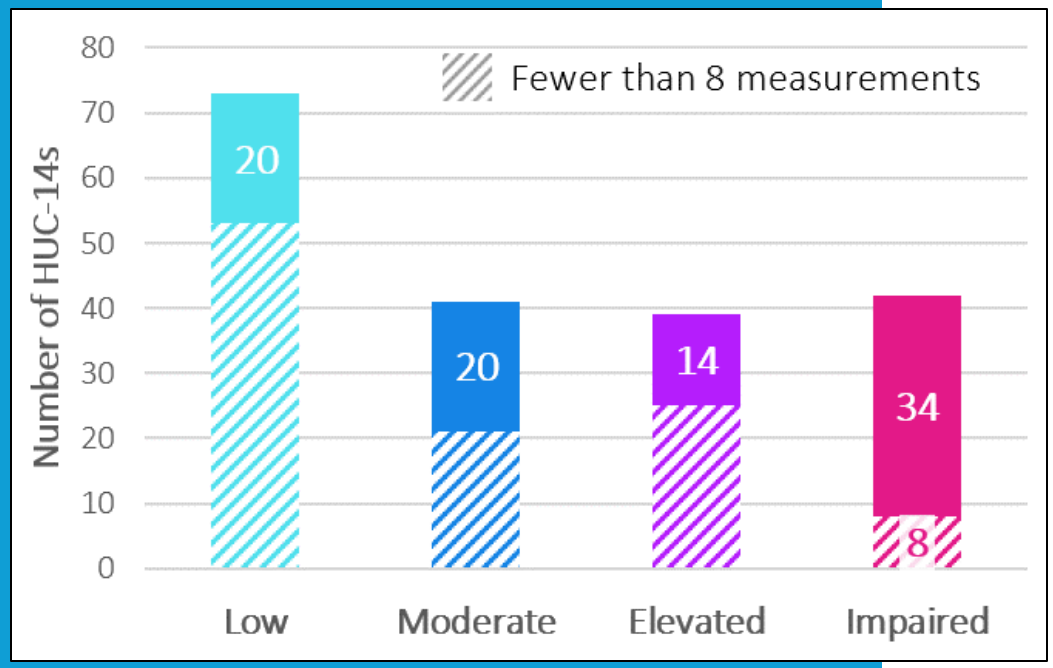
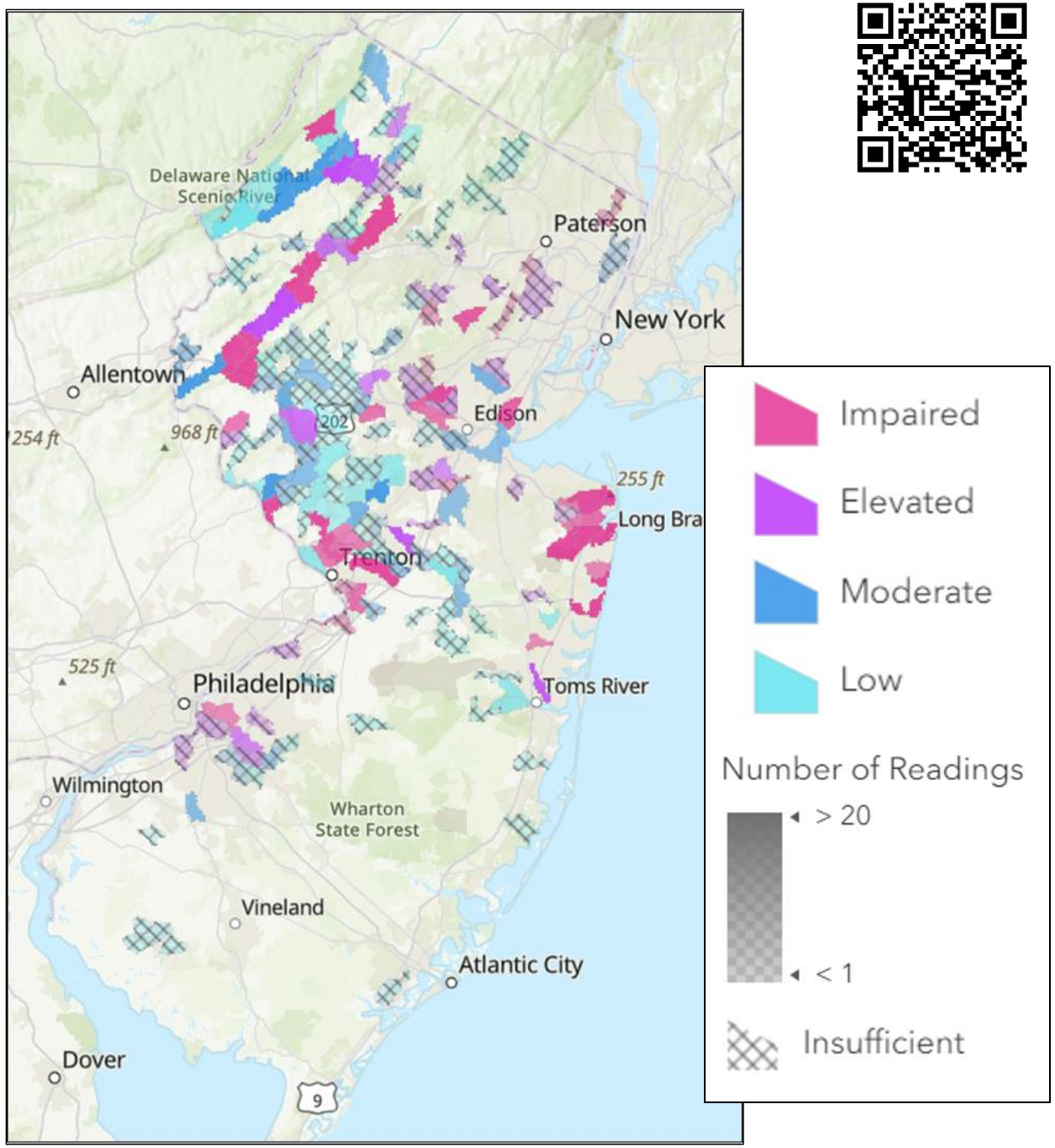
NJ Salt Watch Median Chloride, Chloride Exceedances, and Mean Snowfall by *Month*



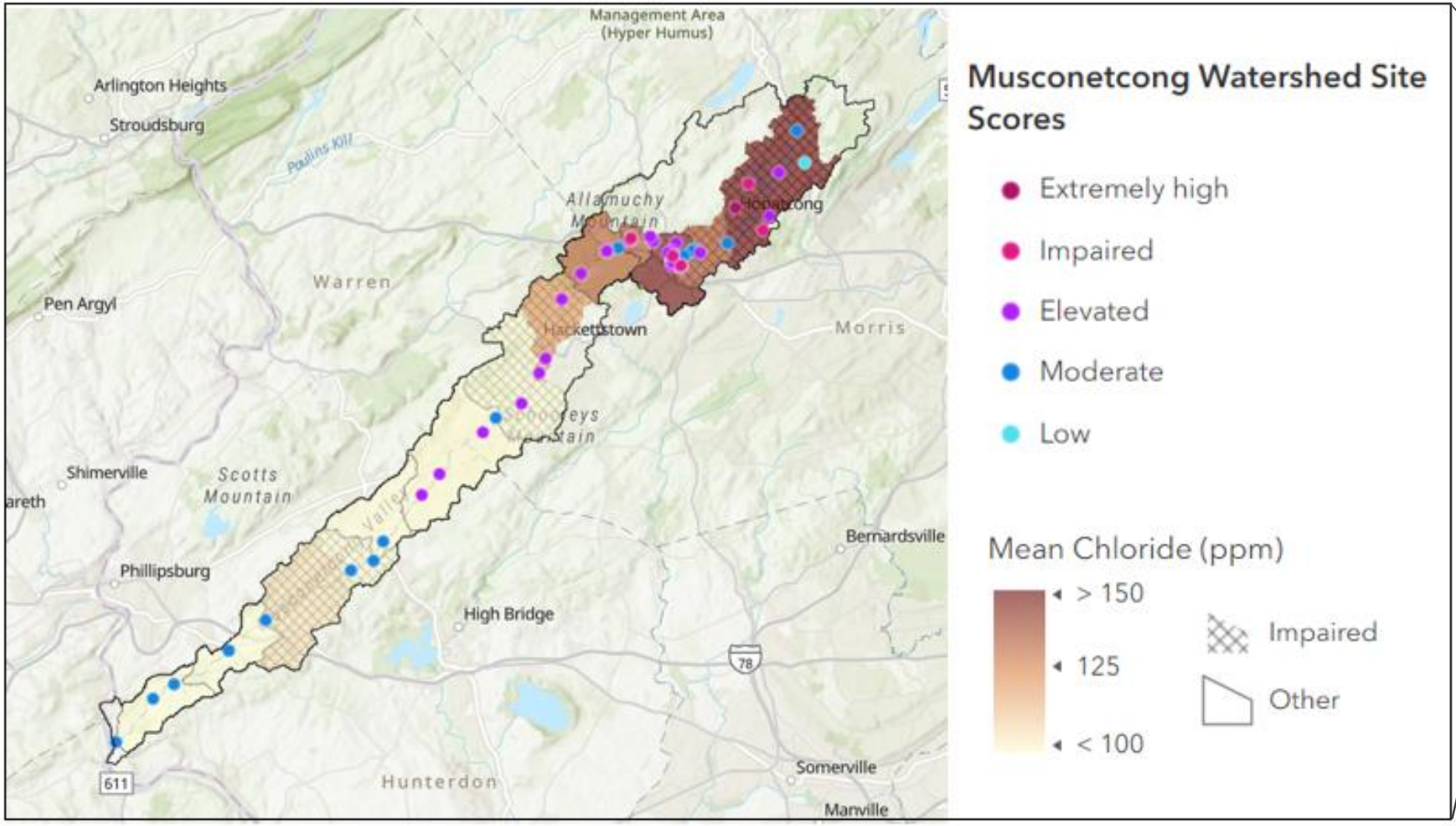
NJ Salt Watch

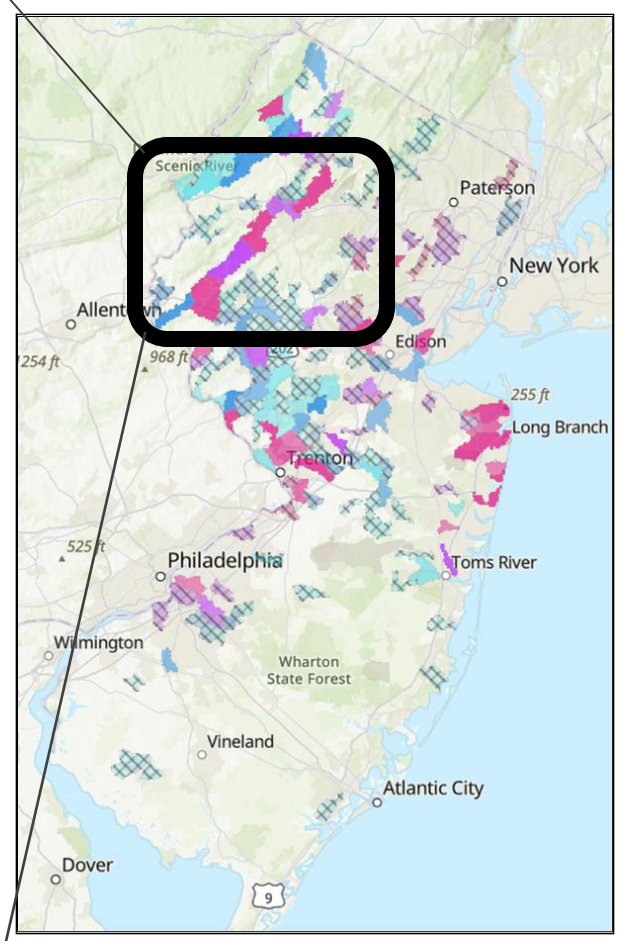
HUC-14 Subwatershed Assessment



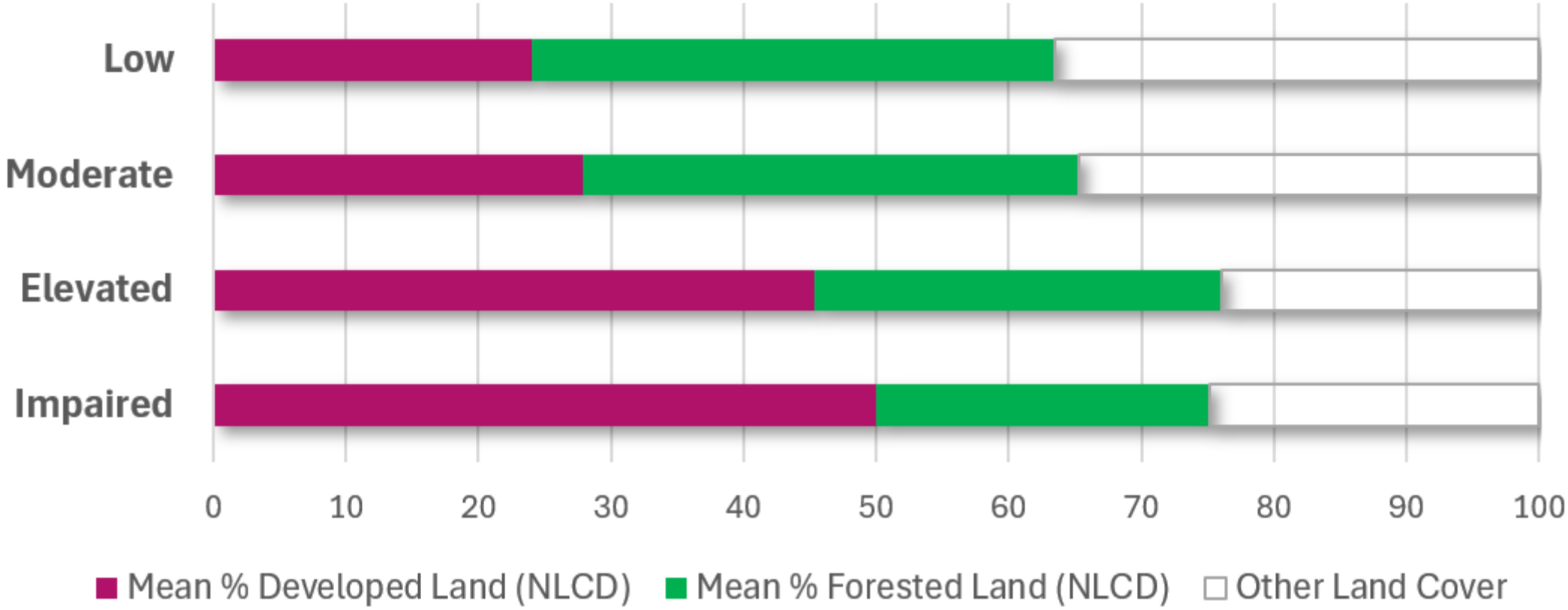


NJ Salt Watch Chloride Trends in Musconetcong River





NJ Salt Watch
Developed or Forested Land Cover Proportions in "Average" HUC-14 Subwatersheds of each Chloride Condition Category

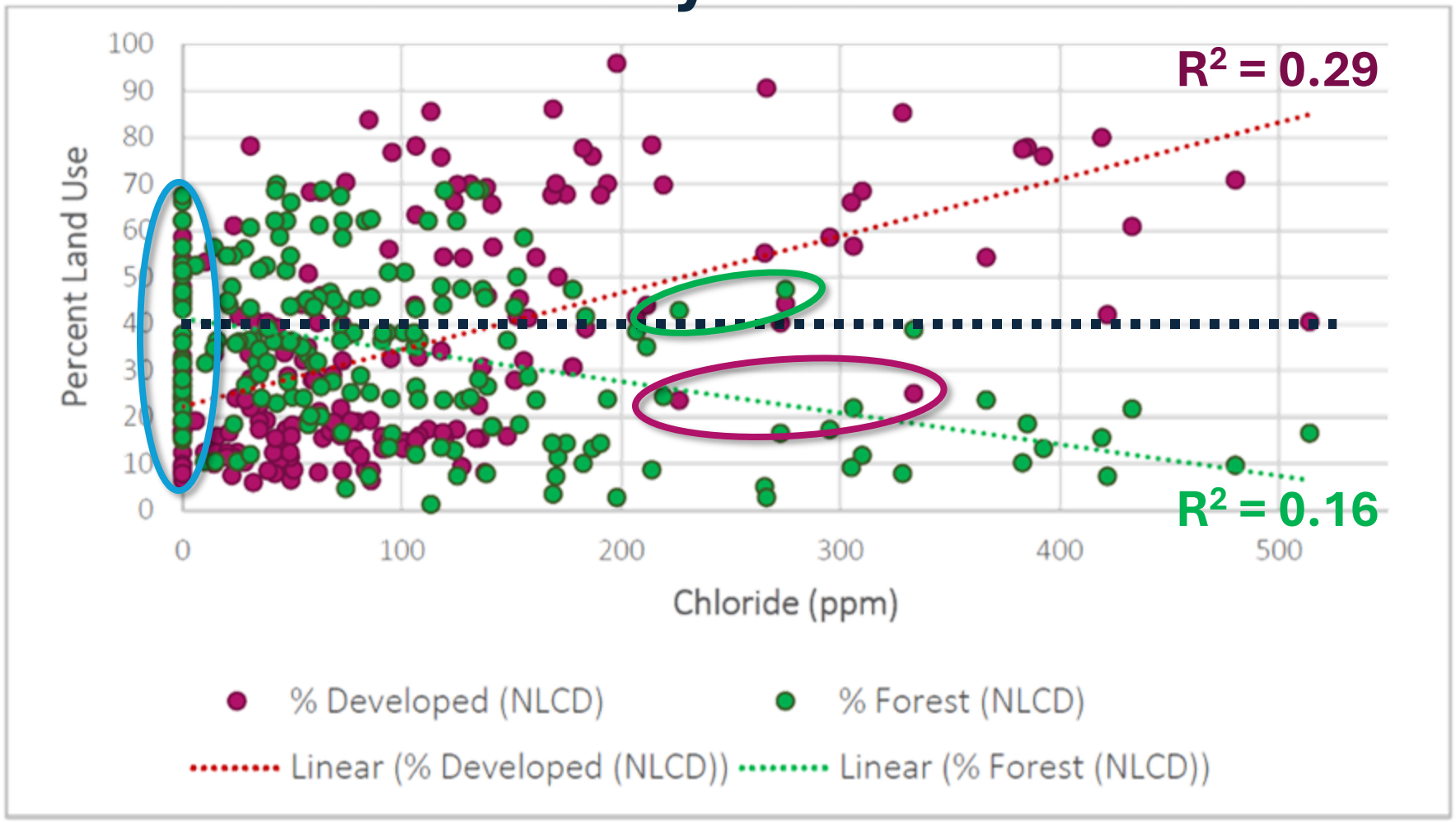


NJ Salt Watch

Mean Chloride by HUC-14 Land Cover

More Imperviousness
=
More Chloride

- Chloride inputs are higher from subwatersheds with more developed land
- This relationship is restricted here by censored data at lower and upper measurement limits

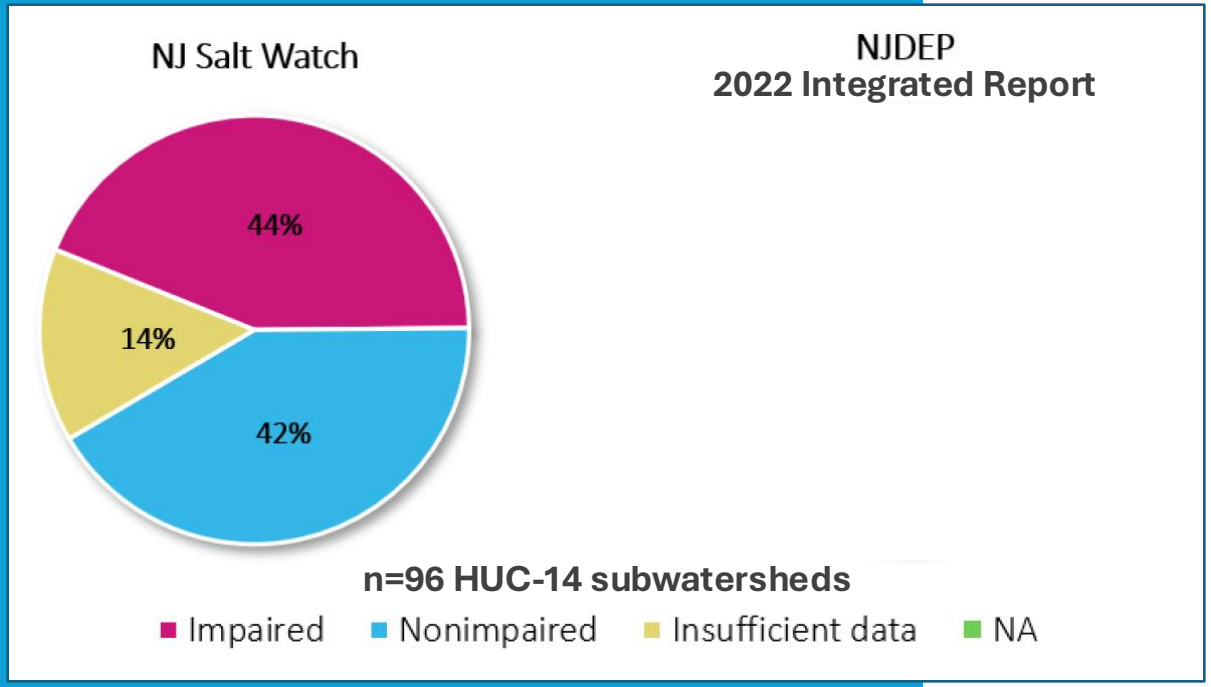


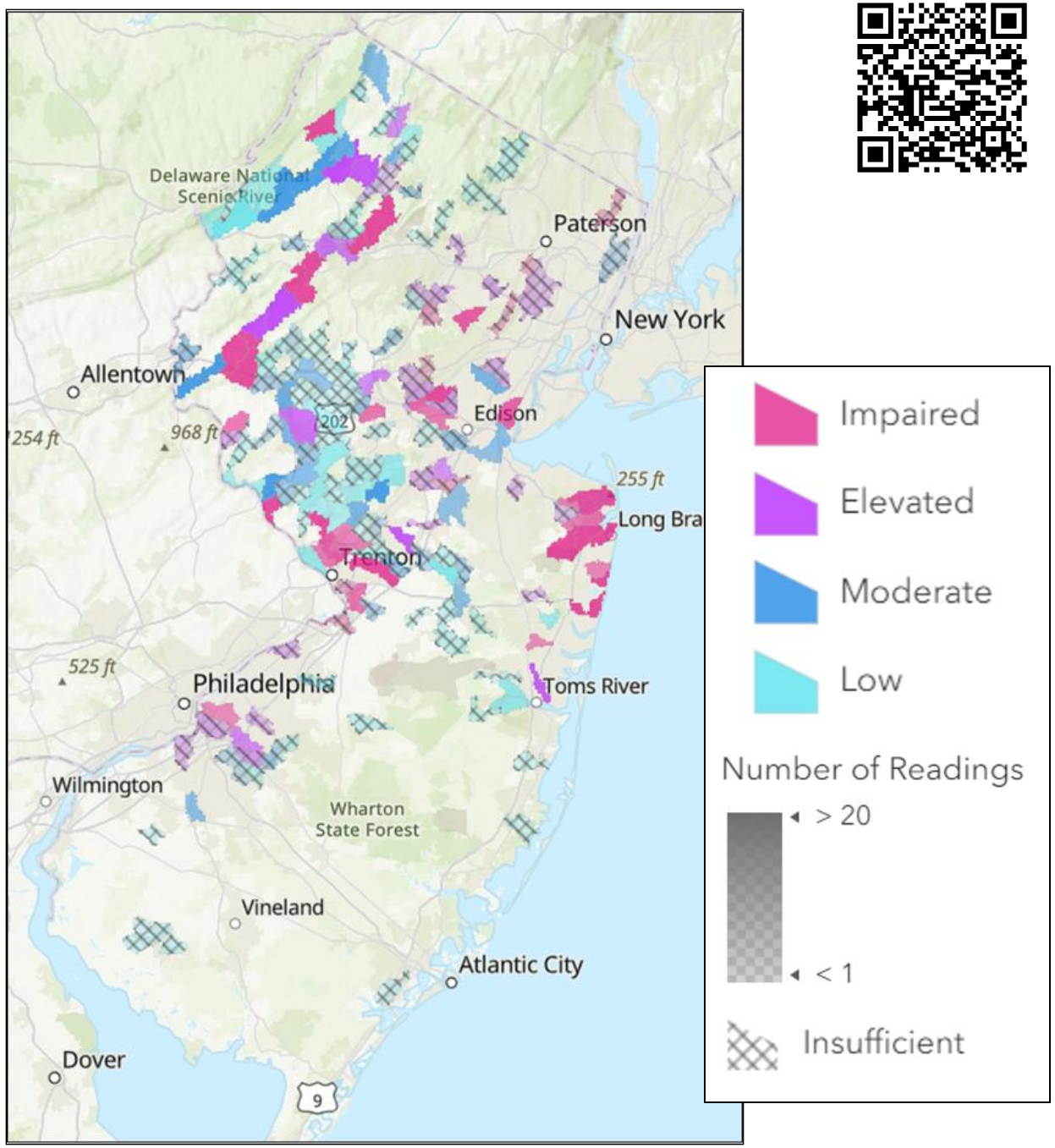
Land use threshold emerged at 40%, with some exceptions

which could be due to differences in road salt application rates

NJ Salt Watch HUC-14 Assessment

Comparing Assessments





NJDEP Next Steps for Regulatory Salt Controls

- **Using NJ Salt Watch data to prioritize locations for additional monitoring**
- Launching studies to develop curves between TDS and Cl

- Developing **Statewide Road Salt TMDL**

- NJDEP awarded funding to Brick Twp Municipal Utilities Authority (BTMUA) to develop **BMP implementation demonstrations, training workshops for NJ municipalities**

- Adoption of the TMDL as an amendment to Water Quality Management Plans
- **Municipal Salt BMP Implementation**

Sustainable Jersey

is a free, voluntary program for **NJ municipalities** to earn points toward certification by implementing **actions** toward water quality, climate planning, clean energy, community health and wellness, resource use and conservation, and more

New Road Salt Action toward a *Gold Star* in Water

Road Salt Actions	Points
Participate in NJ Salt Watch: Collect data & present results to community	5
Workforce training on road salt application	5
Road salting inventory, including equipment and condition, salt application rates, and total salt use	10
Implementation of road salt best management practices	5 per BMP

Why Participate?

Opens up **grant funding** for project implementation

Technical **guidance** and **tools**

Saves **money**!

NJ Salt Watch

Municipal Assessment

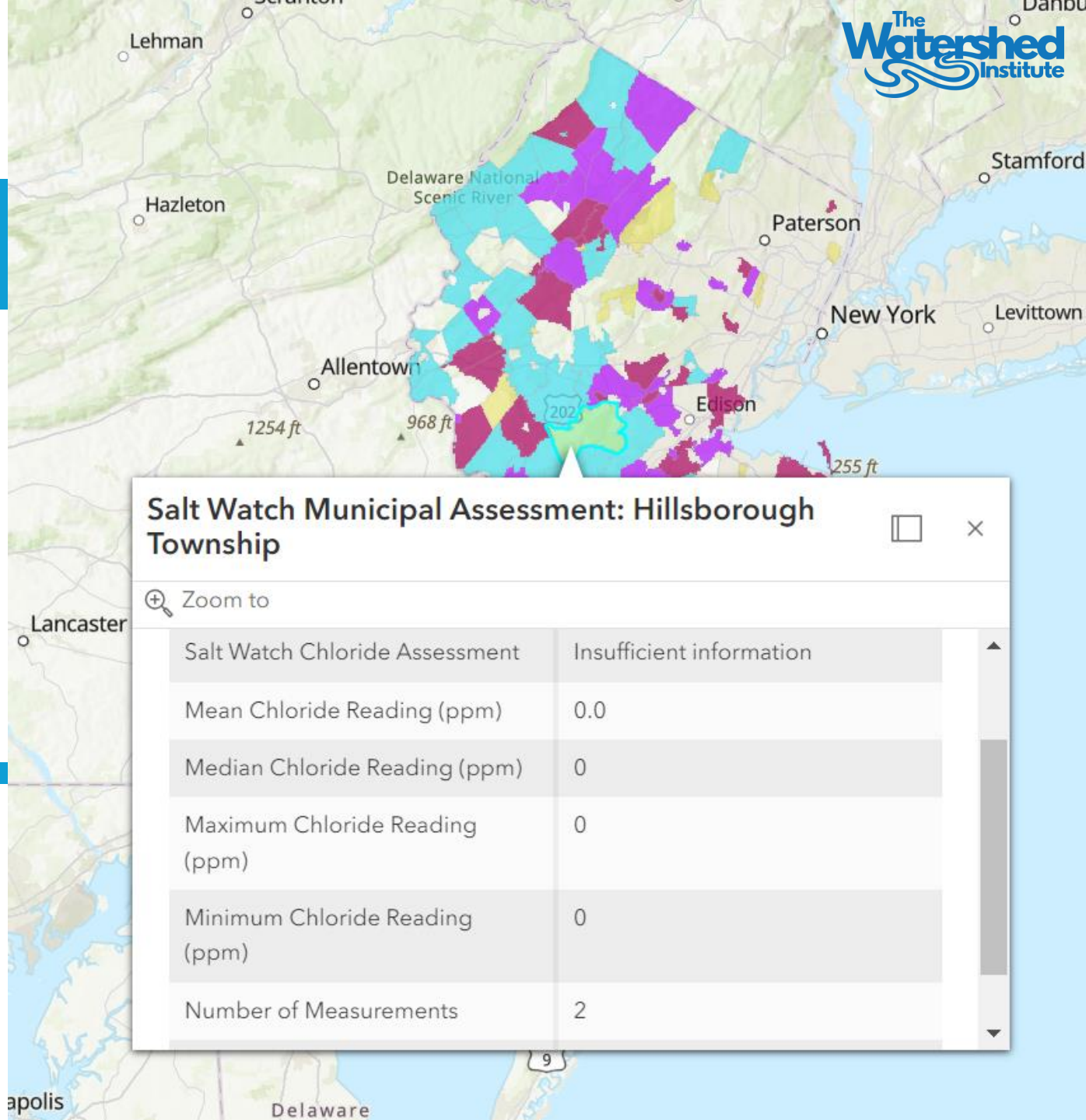
High: > 2 exceedances

Vulnerable: 1 exceedance, if not an outlier

Low: No exceedances

Insufficient info: <3 measurements

Scan here to view the NJ Salt Watch story map



Winter Salt Week

January 27-31 (next week!)

Monday-Thursday

Daily webinars at 1:30pm

- View livestreams at wintersaltweek.org

Friday, January 31

Volunteer water monitoring events

- **MD**: Izaak Walton League Salt Watch Open House 1-3PM (details at wintersaltweek.org)
- **NJ**: Statewide Snapshot njwatershedwatch.org/saltwatch

Contact

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NJ Watershed Watch Network Coordinator | njwatershedwatch.org

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