Leveraging EPA's Water Quality Portal to expand the Phase 7 watershed model calibration dataset

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WQGIT

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Developing a reproducible workflow to download water quality data from EPA's Water Quality Portal (WQP)

Motivation

- We needed to update the watershed model calibration dataset for P7

- The P6 calibration dataset was obtained through an ad-hoc process that is not easily reproducible

- We wanted to develop an automated workflow that allows us to regularly update and expand our calibration dataset without major efforts

- March 2023: STAC Workshop "Using Local Monitoring Results to Inform CBP's Watershed model":
  - It is very important to local monitoring agencies that their stations are used to calibrate the CBP watershed model if possible
  - Need for a transparent and streamlined process to submit monitoring data for use in watershed model calibration

Three main purposes for WQP dataset

Each purpose has different data requirements and different criteria for station/data inclusion

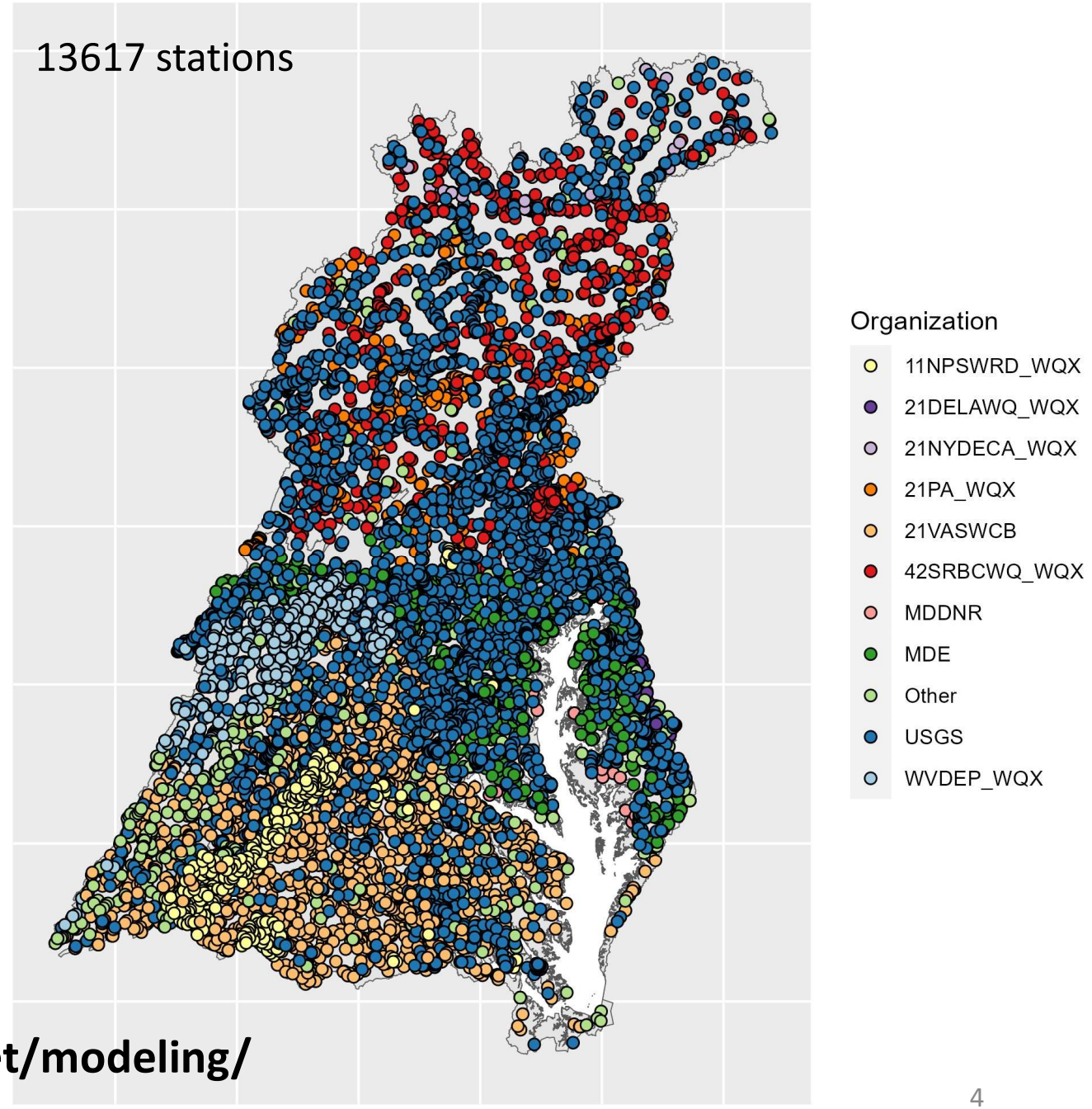
- **Dynamic watershed model** calibration and verification
    - Raw constituent concentrations (for calibration)
    - Load estimation (for verification)

- **CalCAST** calibration
    - Load estimation

- **Other applications** (e.g., Machine Learning project)
    - Retain as much data as possible (while flagging/fixing issues)

Monitoring stations with processed **N, P** and/or **SS** data

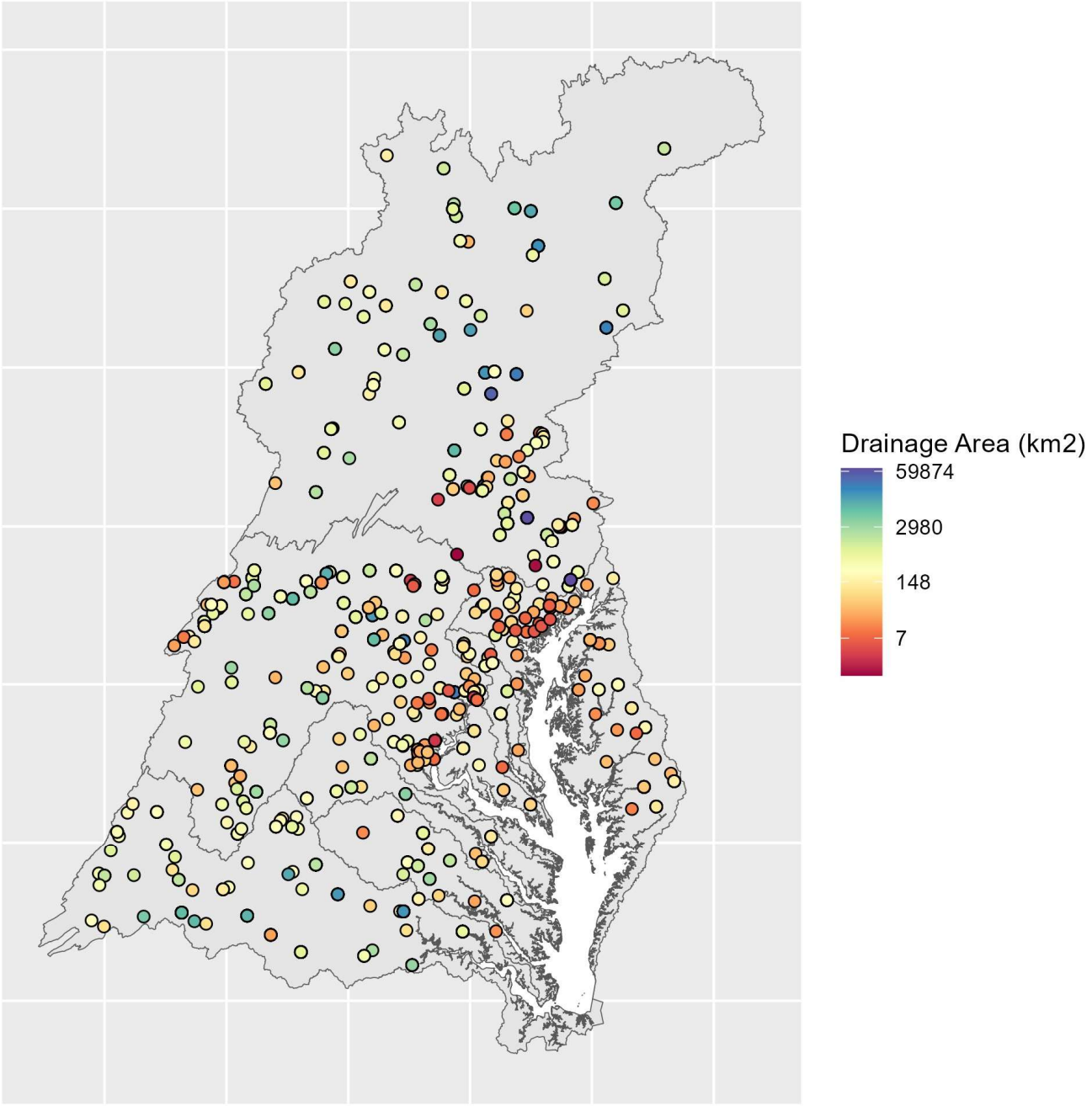
	N stations
TN	8386
NO3	10633
NH3	8522
TP	7991
PO4	5568
SS	7842



Spatial layer available at:
https://gis.chesapeakebay.net/modeling/

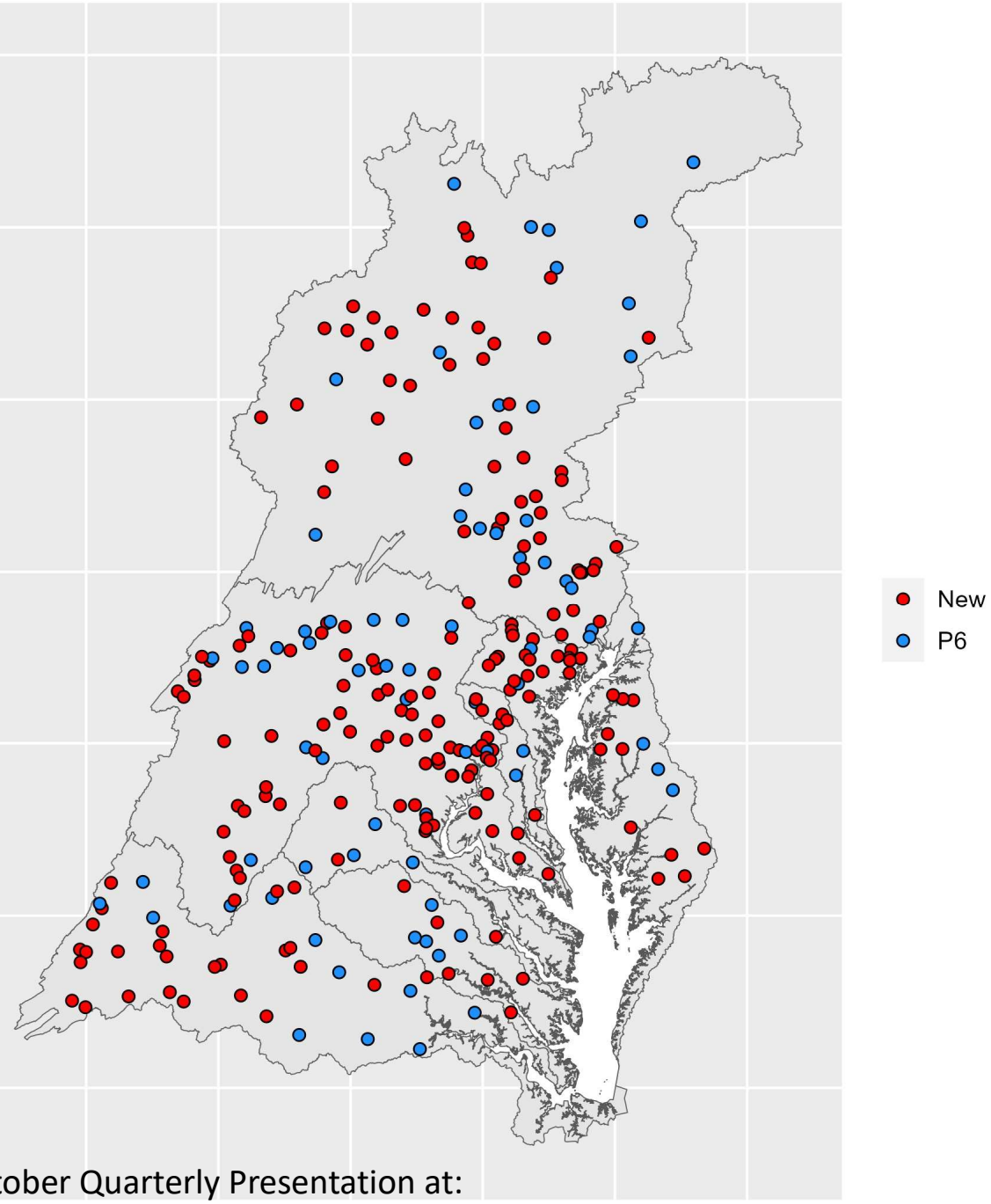
Monitoring stations matched to streamflow gages and considered for Dynamic Model calibration

	N stations
TN:	362
TP:	367
SS:	359
NO3:	367
NH3:	360
PO4:	280



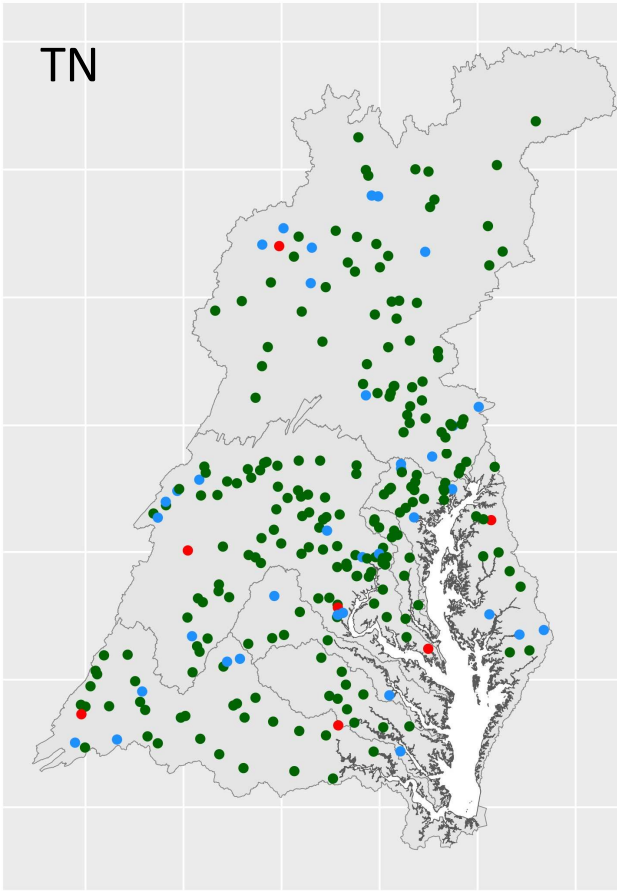
Monitoring stations passing criteria* for **load** estimation

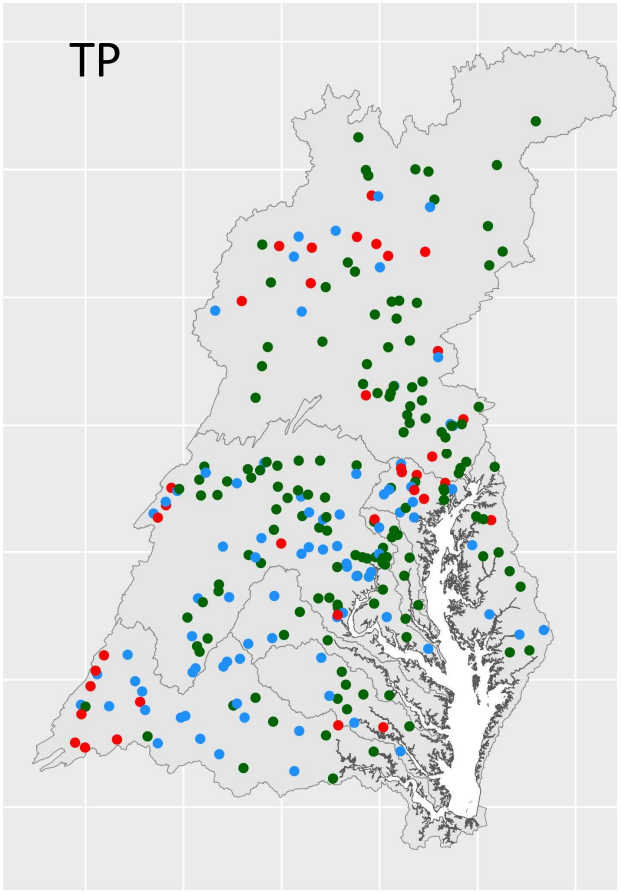
	N stations
TN	264
TP	265
SS	258

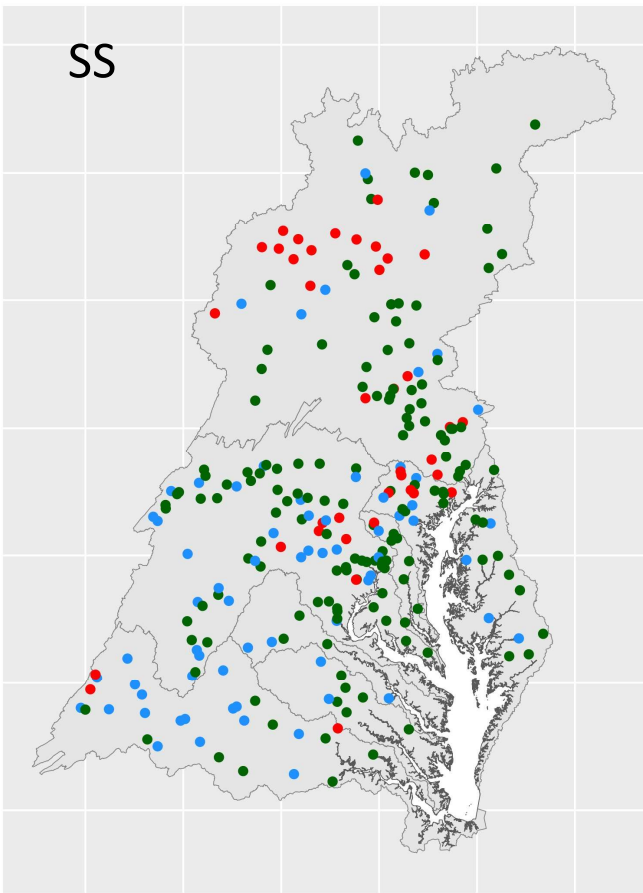


*For detailed criteria, see MWG October Quarterly Presentation at:
https://www.chesapeakebay.net/what/event/modeling-workgroup-meeting-quarterly-review-october-2023

WRTDS load estimation and assessment





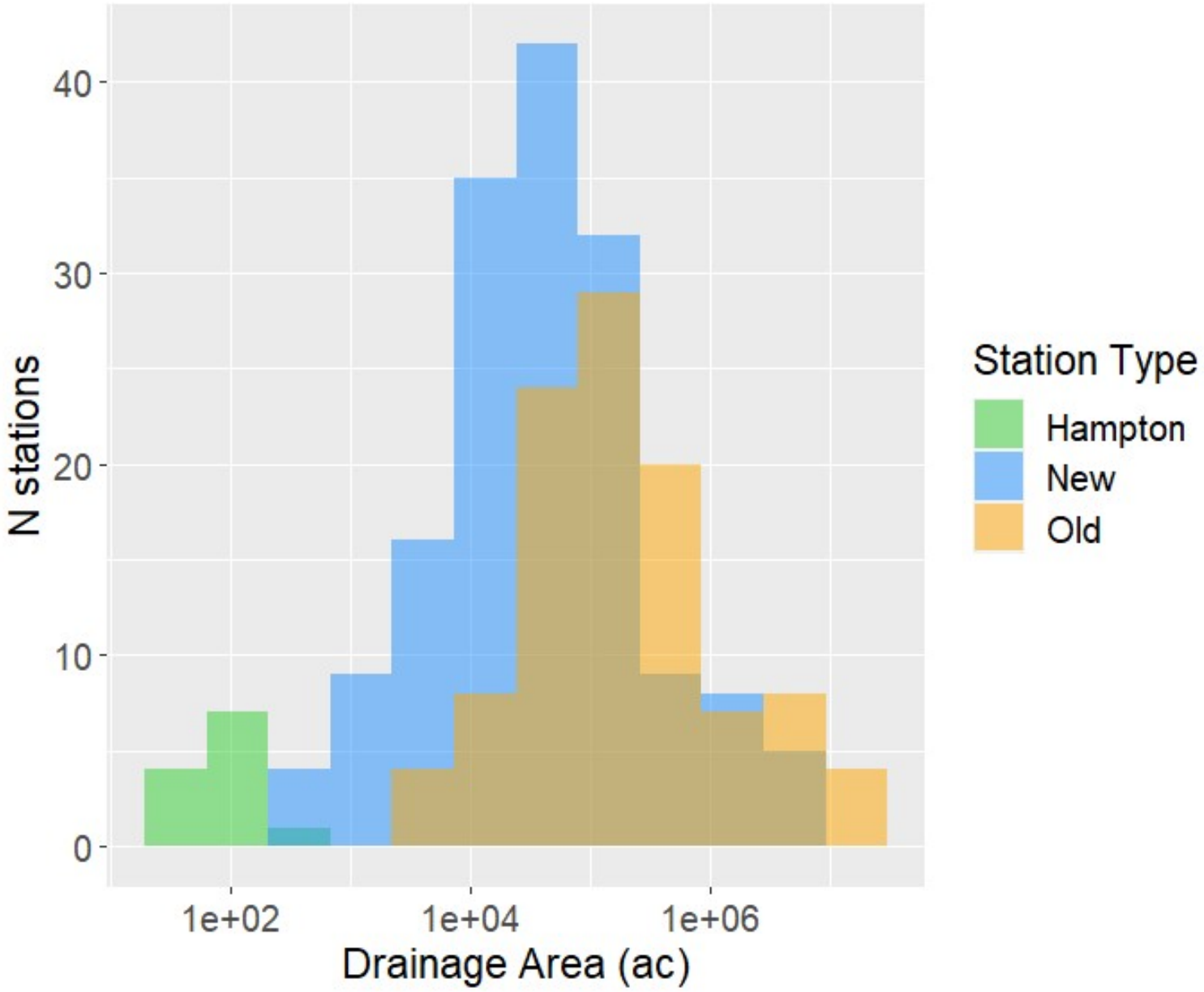


Retain	
Yes	221
Maybe	36
No	7

Retain	
Yes	145
Maybe	84
No	36

Retain	
Yes	152
Maybe	68
No	38

TN load station drainage area – P6 vs P7



Next Steps

- Present to relevant STAR workgroups (e.g., Non-tidal Network Workgroup) and ask monitoring agencies to provide any feedback. Example of helpful feedback:
    - Are we missing any important stations?
    - Are we missing data within a station?
    - Should we exclude any station?
    - Did we incorrectly identify constituents?
- Re-do data pull from Water Quality Portal in 2025