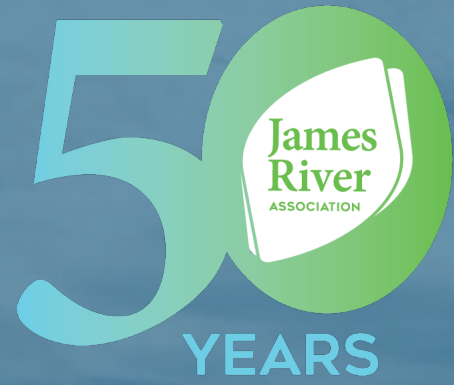




# A Look at Virginia's Surface Water Supply & Use

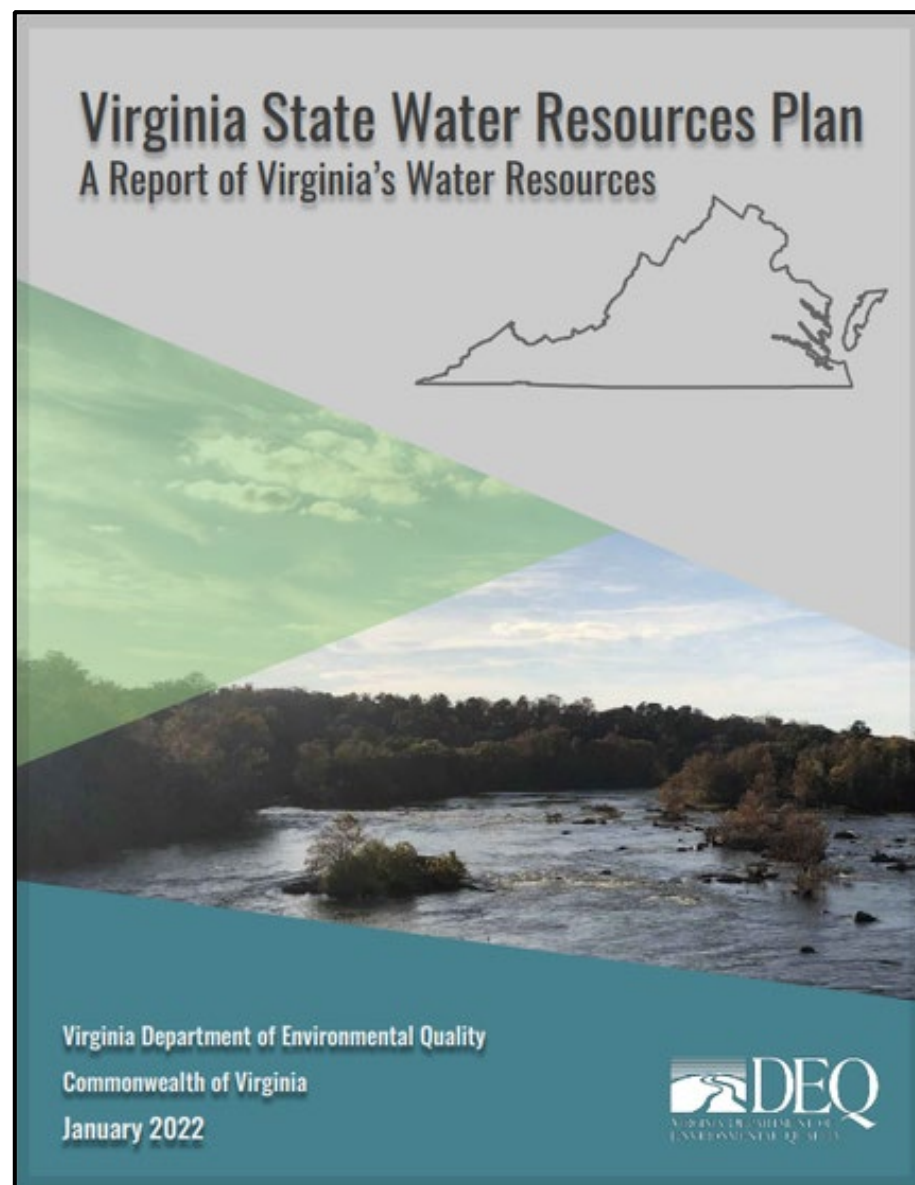
Chesapeake Bay Commission Meeting — August 18th, 2026

---

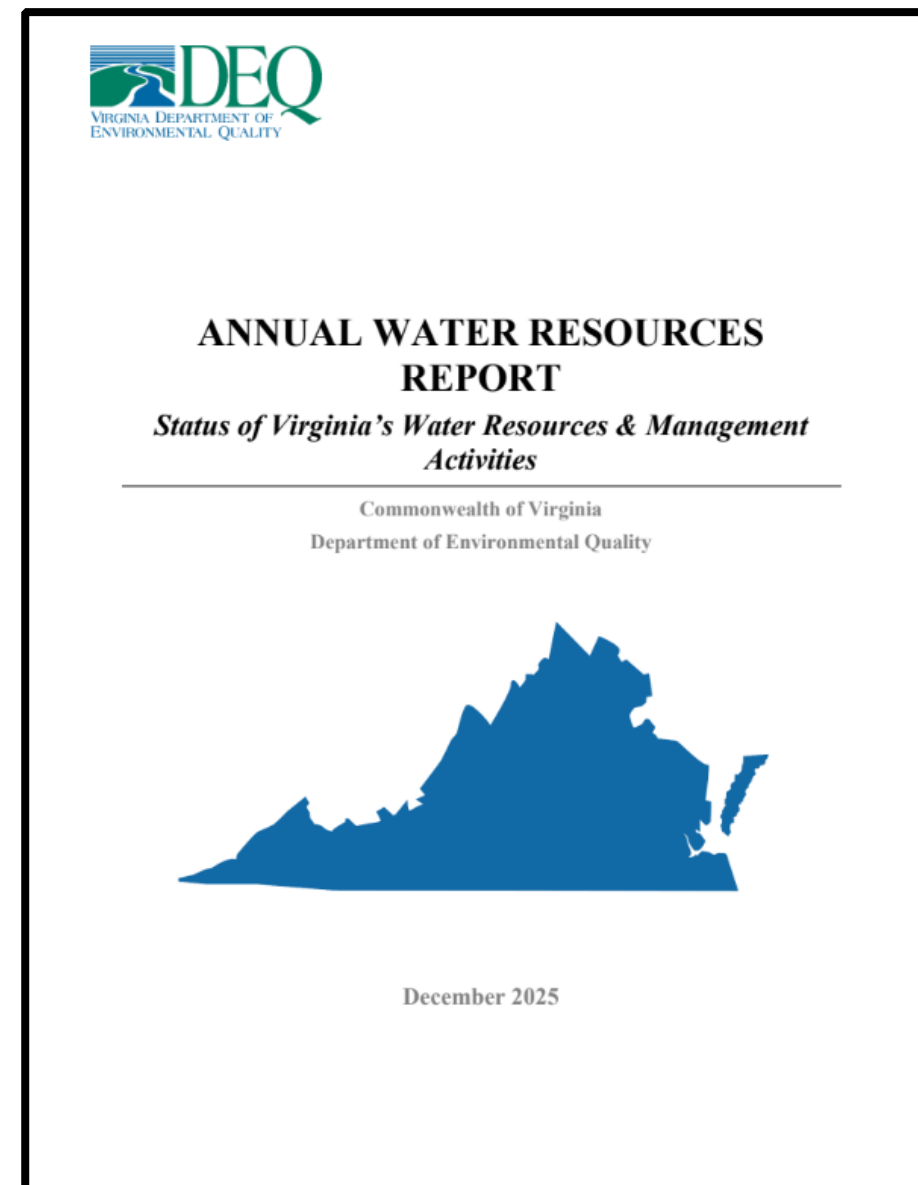
Tom Dunlap, James River Association



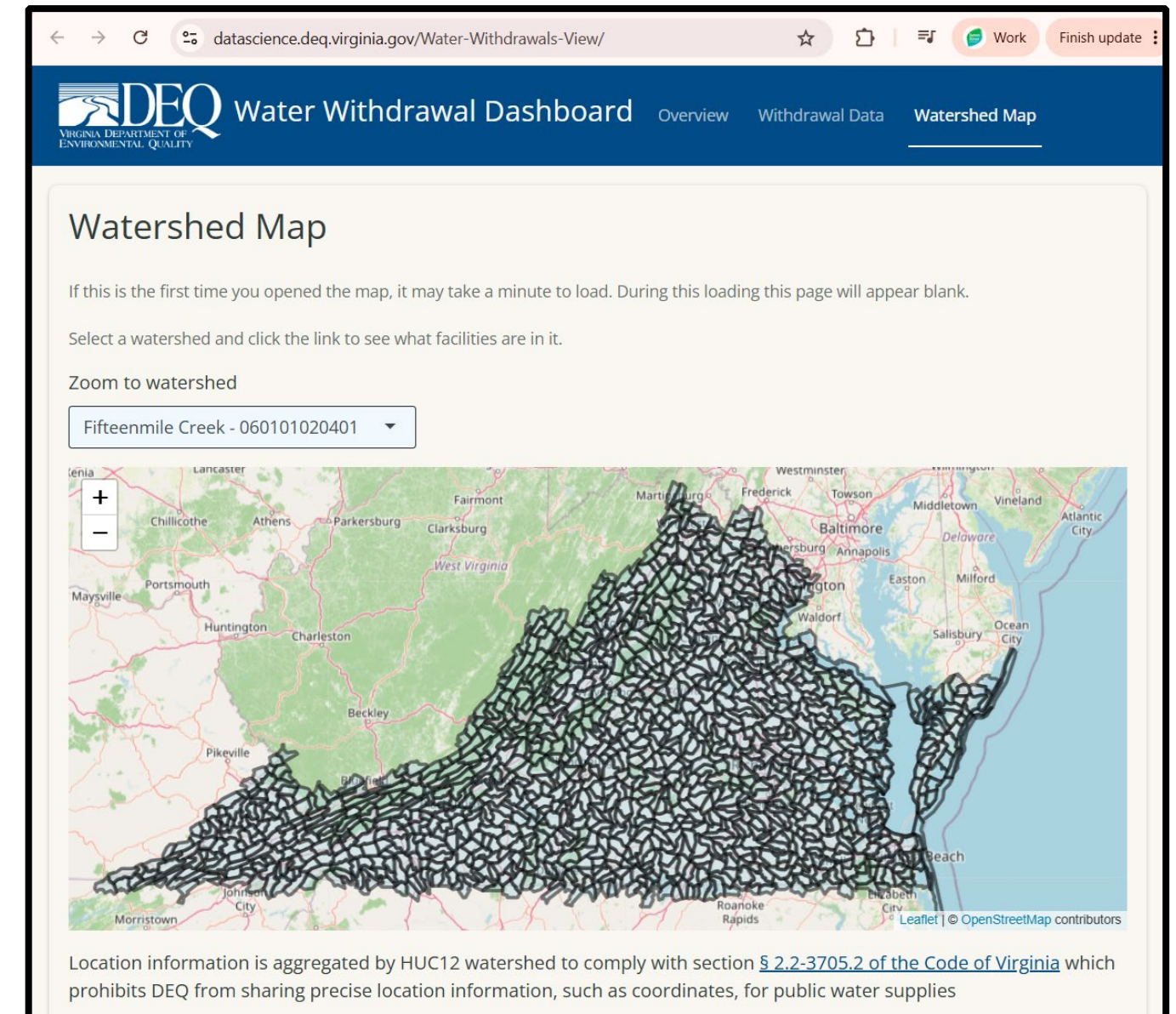
# Where Does Virginia Surface Water Data Come From?



***Published: 2022***  
***Data: 2020***  
***20 year projection***



***Published: 2025***  
***Data: 2024***  
***5 year average***



***Published: 2026***  
***Data: 2025***  
***Annual data***

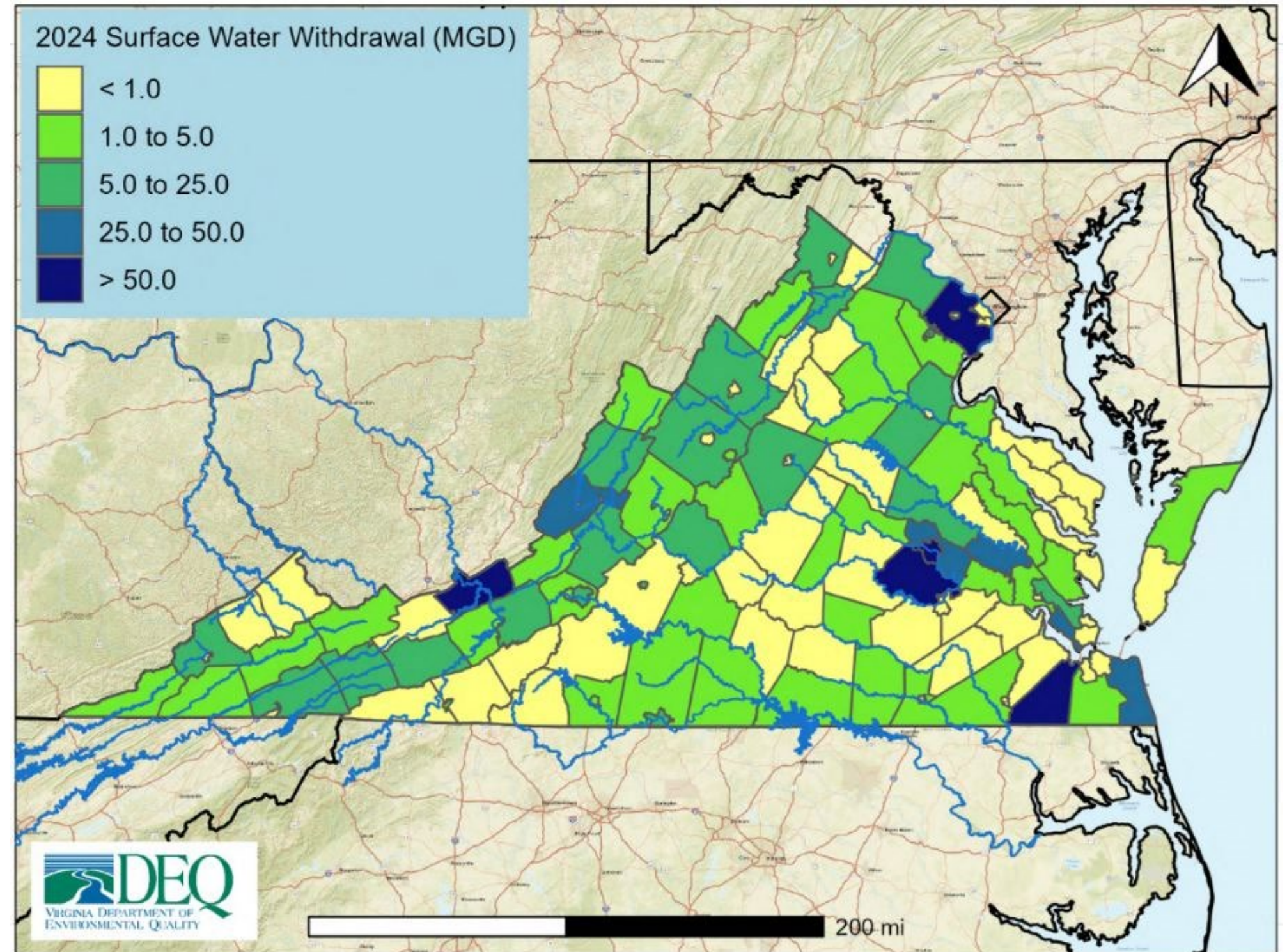


# How Is Surface Water Used in VA?

## 2025 Data on Reported Surface Water Withdrawal

| Use Type            | MGD    | % total |
|---------------------|--------|---------|
| Agriculture         | 25.8   | 0.49%   |
| Commercial          | 10.8   | 0.20%   |
| Fossil Power        | 252.2  | 4.80%   |
| Industrial          | 296.4  | 5.64%   |
| Irrigation          | 15.0   | 0.29%   |
| Mining              | 11.1   | 0.21%   |
| Nuclear Power       | 3866.9 | 73.59%  |
| Public Water Supply | 776.4  | 14.78%  |
| Other Power         | 0.4    | 0.01%   |
| total:              | 5255.0 |         |
| total (no power):   | 1135.4 |         |

*Yes but, there are other withdrawals that are not reported...*





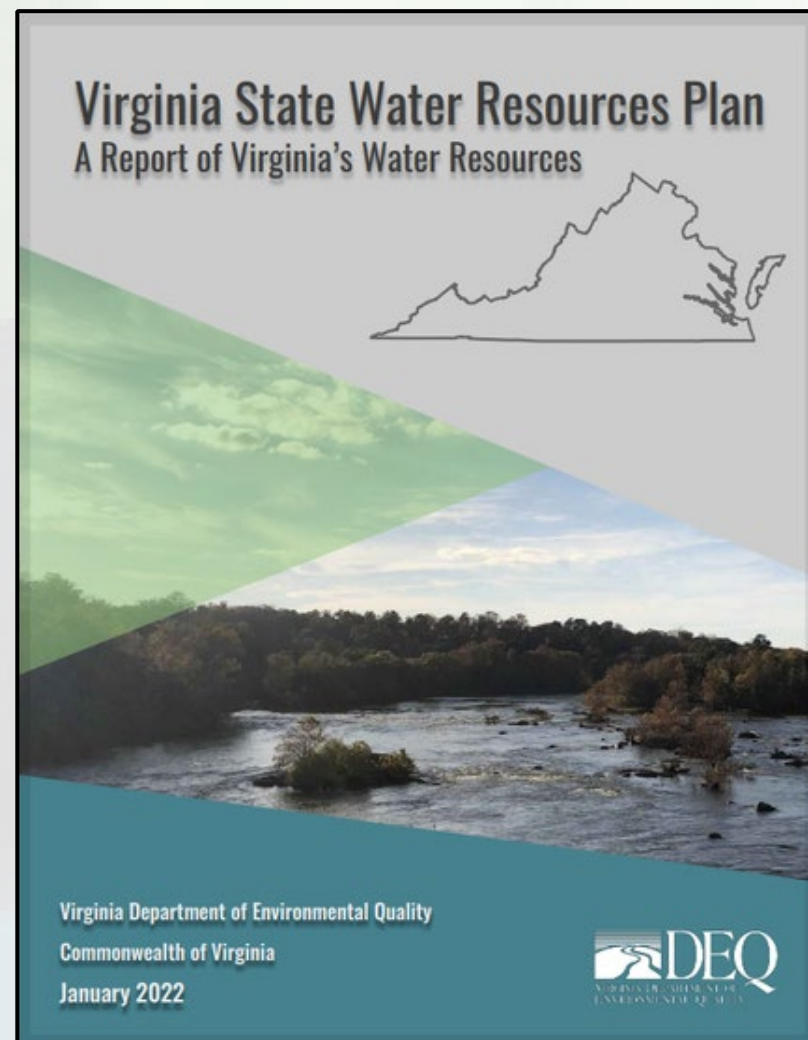
# What Do We Think Water Demand Will Be in the Future?

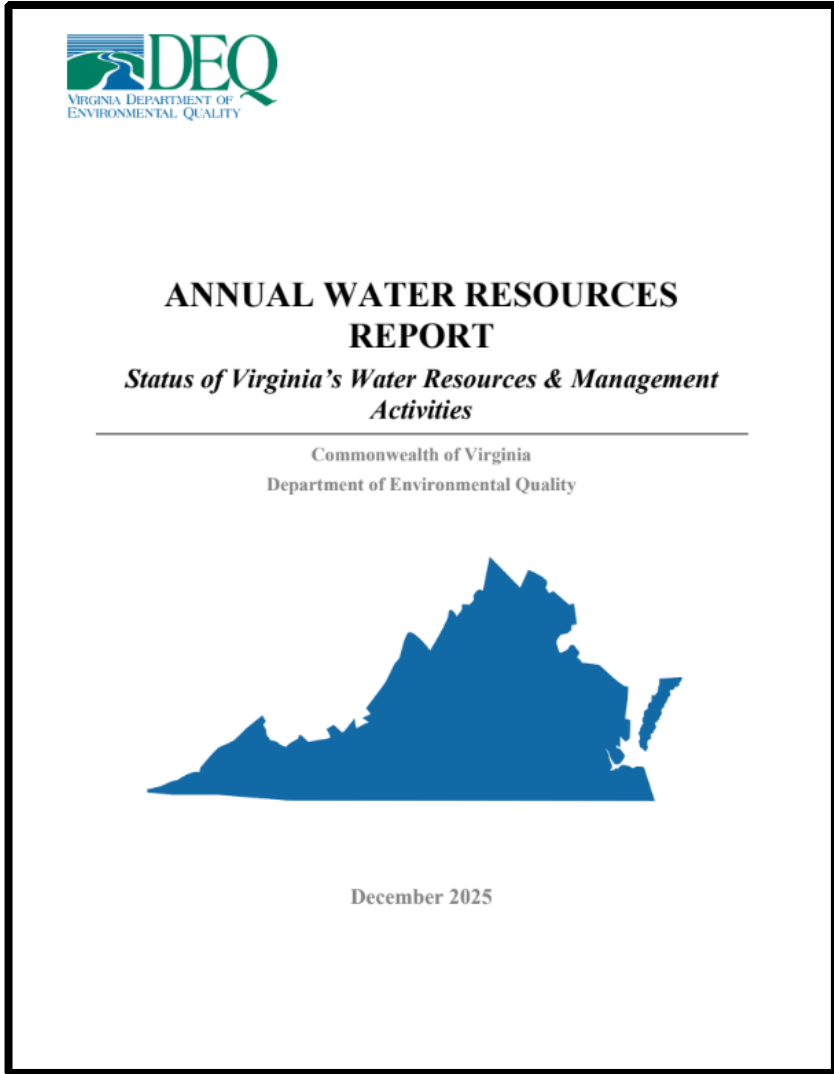
## 2020 State Water Resources Plan

Table 1: Summary of Virginia Water Demand by Source Type and System Type (excluding Power Generation)

| System Type            | Source Count | 2020 Demand (MGD) | 2030 Demand (MGD) | 2040 Demand (MGD) | 20 Year Percent Change |
|------------------------|--------------|-------------------|-------------------|-------------------|------------------------|
| <b>Surface Water</b>   |              |                   |                   |                   |                        |
| Agriculture            | 456          | 75.73             | 77.94             | 80.15             | 5.83                   |
| CWS                    | 208          | 884.22            | 991.25            | 1098.28           | 24.21                  |
| Large SSU              | 328          | 343.47            | 356.76            | 370.05            | 7.74                   |
| Small SSU              | N/A          | 0.00              | 0.00              | 0.00              | 0.00                   |
| <b>Total SW</b>        | <b>992</b>   | <b>1303.42</b>    | <b>1425.95</b>    | <b>1548.48</b>    | <b>18.80</b>           |
| <b>Total (SW + GW)</b> |              |                   |                   |                   |                        |
| Agriculture            | 956          | 85.25             | 87.91             | 90.56             | 6.22                   |
| CWS                    | 1595         | 940.78            | 1071.35           | 1201.93           | 27.76                  |
| Large SSU              | 985          | 418.98            | 433.47            | 447.97            | 6.92                   |
| Small SSU              | N/A          | 137.82            | 156.25            | 174.69            | 26.75                  |
| <b>Virginia</b>        | <b>3536</b>  | <b>1582.83</b>    | <b>1748.98</b>    | <b>1915.15</b>    | <b>21.00</b>           |

\* Small SSU demands are county-wide estimates of private well usage below 300,000 gallons a month. The number of private wells is not known.





# 2025 Virginia Annual Water Resources Report

Table 2: 2024 Permitted and Unpermitted (Excluded) By Use Type Withdrawals (MGD)

| Use Type            | Annual Withdrawal Amount |           | % of Total  |           |
|---------------------|--------------------------|-----------|-------------|-----------|
|                     | Unpermitted              | Permitted | Unpermitted | Permitted |
| Surface Water       |                          |           |             |           |
| Agriculture         | 24.72                    | 0.39      | 2.20        | 0.03      |
| Commercial          | 8.12                     | 1.19      | 0.72        | 0.11      |
| Industrial          | 280.96                   | 8.42      | 24.98       | 0.75      |
| Irrigation          | 18.81                    | 0.05      | 1.67        | 0.00      |
| Mining              | 12.44                    | 0.15      | 1.11        | 0.01      |
| Public Water Supply | 571.11                   | 198.27    | 50.78       | 17.63     |
| Total Surface Water | 916.16                   | 208.46    | 81.46       | 18.54     |

\*Excluding Power Generation Facilities

Table 1: Summary of Virginia Water Withdrawals by Use Category and Source Type 2019 - 2024 (MGD)

| Category              | 2019    | 2020    | 2021    | 2022    | 2023    | 2024    | 5 Year Avg.<br>(2019-2023) | % Change<br>2024 to Avg. |
|-----------------------|---------|---------|---------|---------|---------|---------|----------------------------|--------------------------|
| Total - without power |         |         |         |         |         |         |                            |                          |
| Total Groundwater     | 138.22  | 140.62  | 147.57  | 143.24  | 133.26  | 151.43  | 140.58                     | 7.72                     |
| Total Surface Water   | 1096.29 | 1041.63 | 1126.38 | 1137.40 | 1133.16 | 1124.62 | 1106.97                    | 1.59                     |
| Total (Gw + Sw)       | 1234.52 | 1182.25 | 1273.96 | 1280.64 | 1266.42 | 1276.05 | 1247.56                    | 2.28                     |

## Exclusion for VWP Surface Water Withdrawal Permit Va. Code § 62.1- 44.15:22

*Notwithstanding any other provision, **no Virginia Water Protection Permit shall be required for any water withdrawal in existence on July 1, 1989;** however, a permit shall be required if a new § 401 certification is required to increase a withdrawal. No Virginia Water Protection Permit shall be required for any water withdrawal not in existence on July 1, 1989, if the person proposing to make the withdrawal received a §401 certification before January 1, 1989, with respect to installation of any necessary withdrawal structures to make such withdrawal; however, a permit shall be required before any such withdrawal is increased beyond the amount authorized by the certification.*

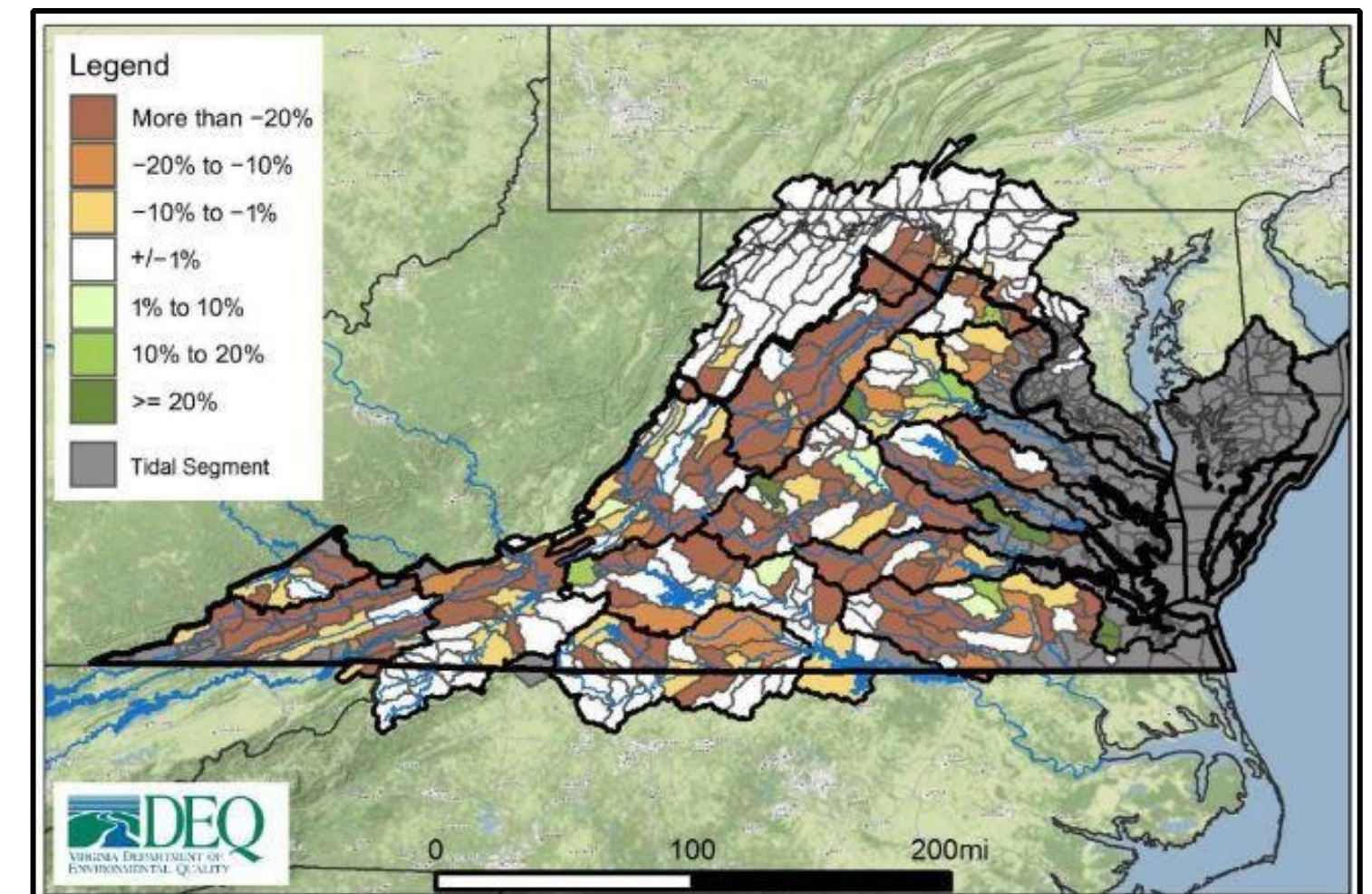
- **For 2025 Reporting records, ~8% of withdrawals were permitted**
- **Permitting includes considerations for impacts to beneficial uses (min. stream flow, aquatic organisms, etc.) and cumulative impacts**



# Water Supply Planning & Significant Concerns

“The exempt user scenario results in reductions of 10% or more over large portions of Virginia for short-term (30 day low flow) and long-term droughts (90 day low flow) compared to the 2020 demand scenario” ... “ a 10% reduction in streamflow represents a threshold where impacts to beneficial uses become more probable, the exempt user scenario often results in simulated streamflow reductions of greater than 50% across all metrics in areas where particularly large or numerous exempt demands are located. Should these demands be realized, impacts to beneficial uses including public water supply and aquatic life would be significant.”

| Major Basin  | Lowest 30<br>Day Low<br>Flow* | Lowest 90<br>Day Low<br>Flow* | 7q10* |
|--------------|-------------------------------|-------------------------------|-------|
| Big Sandy    | 50.00                         | 50.00                         | 33.33 |
| James        | 44.33                         | 39.18                         | 49.48 |
| Meherrin     | 53.85                         | 30.77                         | 57.69 |
| New River    | 28.13                         | 28.13                         | 28.13 |
| Potomac      | 24.84                         | 16.56                         | 22.93 |
| Rappahannock | 11.76                         | 5.88                          | 11.76 |
| Roanoke      | 31.58                         | 21.05                         | 31.58 |
| Tennessee    | 61.90                         | 47.62                         | 66.67 |
| York         | 50.00                         | 45.00                         | 50.00 |

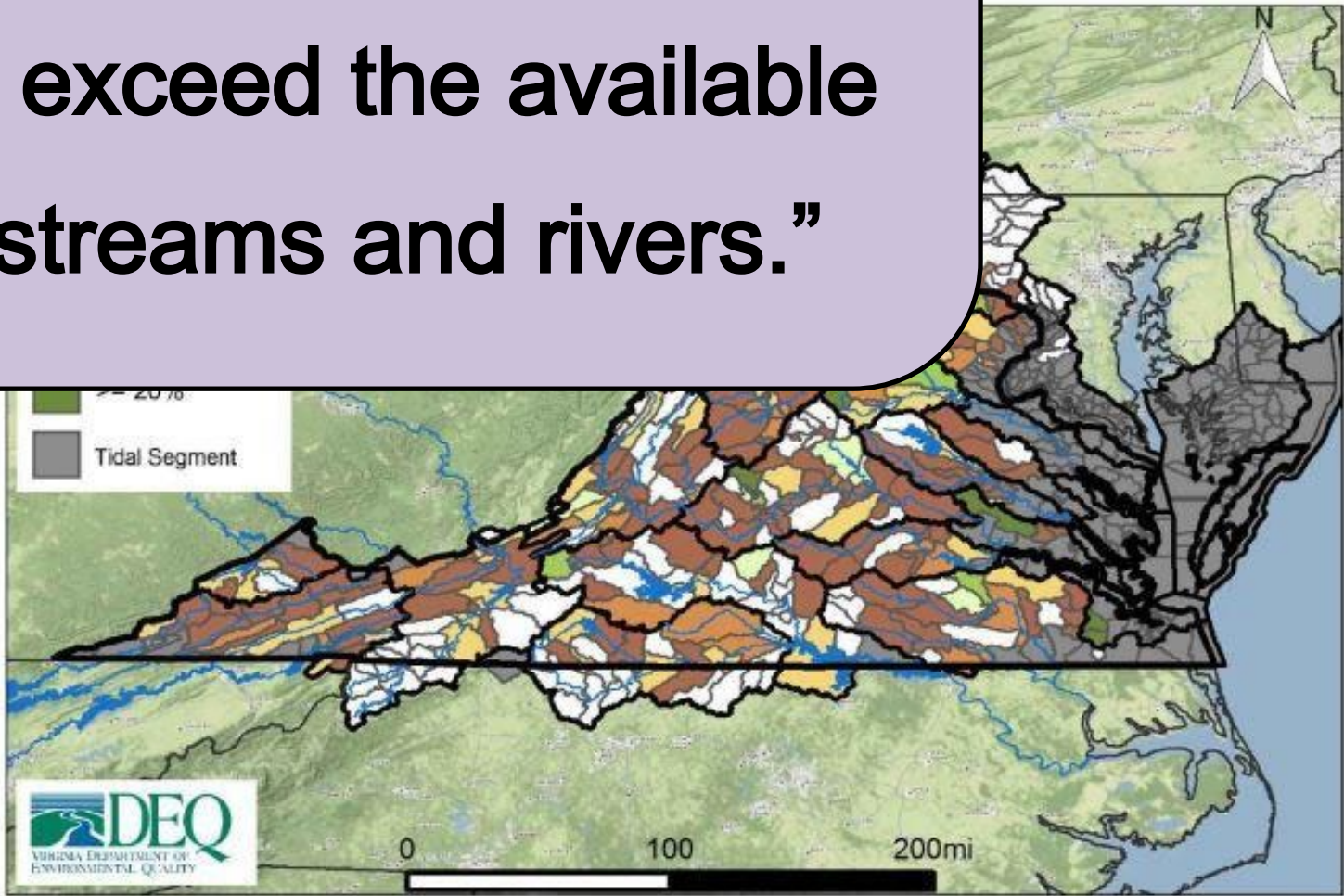




“The exempt user scenario results in reductions of 10% or more over large portions of Virginia for short-term (30 day low flow) and long-term droughts (90 day low flow) compared to the 2020 demand scenario” ... “ a 10% reduction in streamflow represents a threshold where impacts to beneficial uses become more probable, the exempt user scenario often results in simulated streamflow reductions of greater than 50% across all metrics in a significant.”

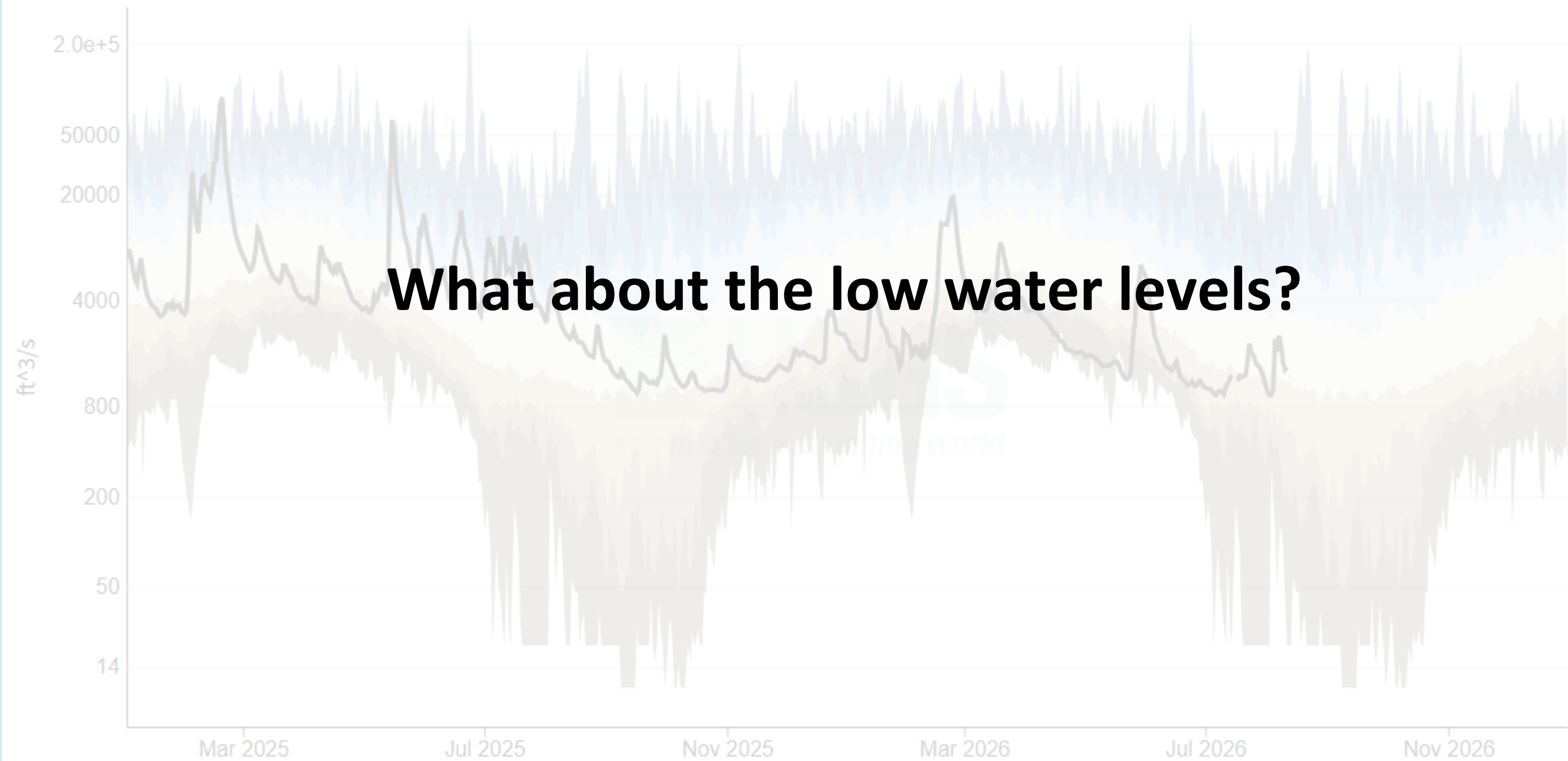
**“The results from [this modeling] scenario suggest that the cumulative maximum possible [water] demands for exempt surface water users would exceed the available water budget in many of Virginia’s streams and rivers.”**

| Major Basins |       |       |       |
|--------------|-------|-------|-------|
| Big Sandy    |       |       |       |
| James        |       |       |       |
| Meherrin     | 53.85 | 30.77 | 57.69 |
| New River    | 28.13 | 28.13 | 28.13 |
| Potomac      | 24.84 | 16.56 | 22.93 |
| Rappahannock | 11.76 | 5.88  | 11.76 |
| Roanoke      | 31.58 | 21.05 | 31.58 |
| Tennessee    | 61.90 | 47.62 | 66.67 |
| York         | 50.00 | 45.00 | 50.00 |





January 1, 2025 - December 31, 2026  
Discharge, cubic feet per second



IMPORTANT Data may be [provisional](#)

[Hide legend](#)

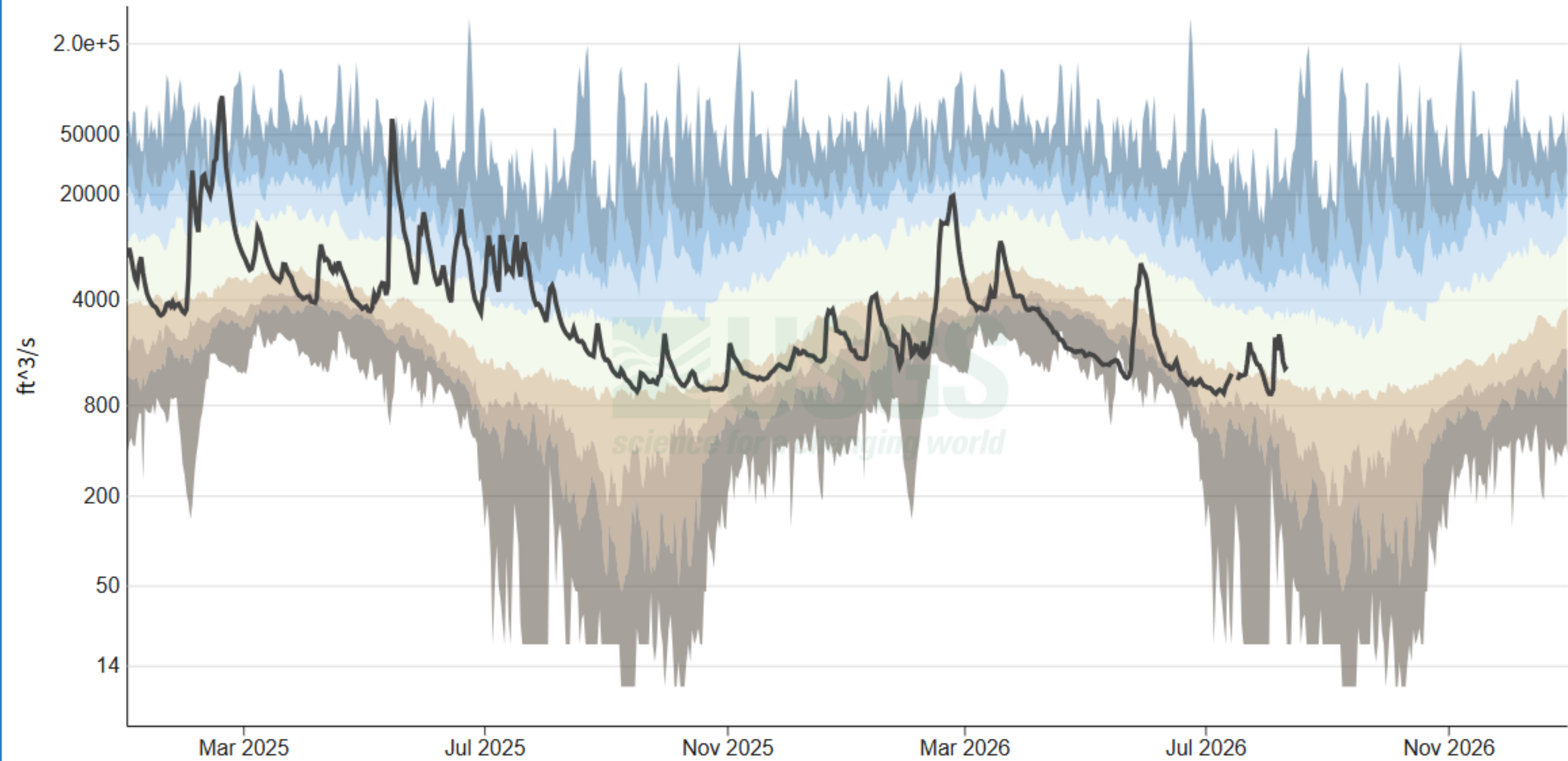
— Daily average (mean) for Discharge, cubic feet per second

Percentile ranges for daily averages (means) for each day of a year (with comparison to normal)

|                        |                    |                       |                 |                       |                     |                           |
|------------------------|--------------------|-----------------------|-----------------|-----------------------|---------------------|---------------------------|
| 0-5<br>Extremely below | 5-10<br>Much below | 10-25<br>Below normal | 25-75<br>Normal | 75-90<br>Above normal | 90-95<br>Much above | 95-100<br>Extremely above |
|------------------------|--------------------|-----------------------|-----------------|-----------------------|---------------------|---------------------------|



January 1, 2025 - December 31, 2026  
**Discharge, cubic feet per second**



**IMPORTANT** Data may be [provisional](#)

[Hide legend](#)

— Daily average (mean) for Discharge, cubic feet per second

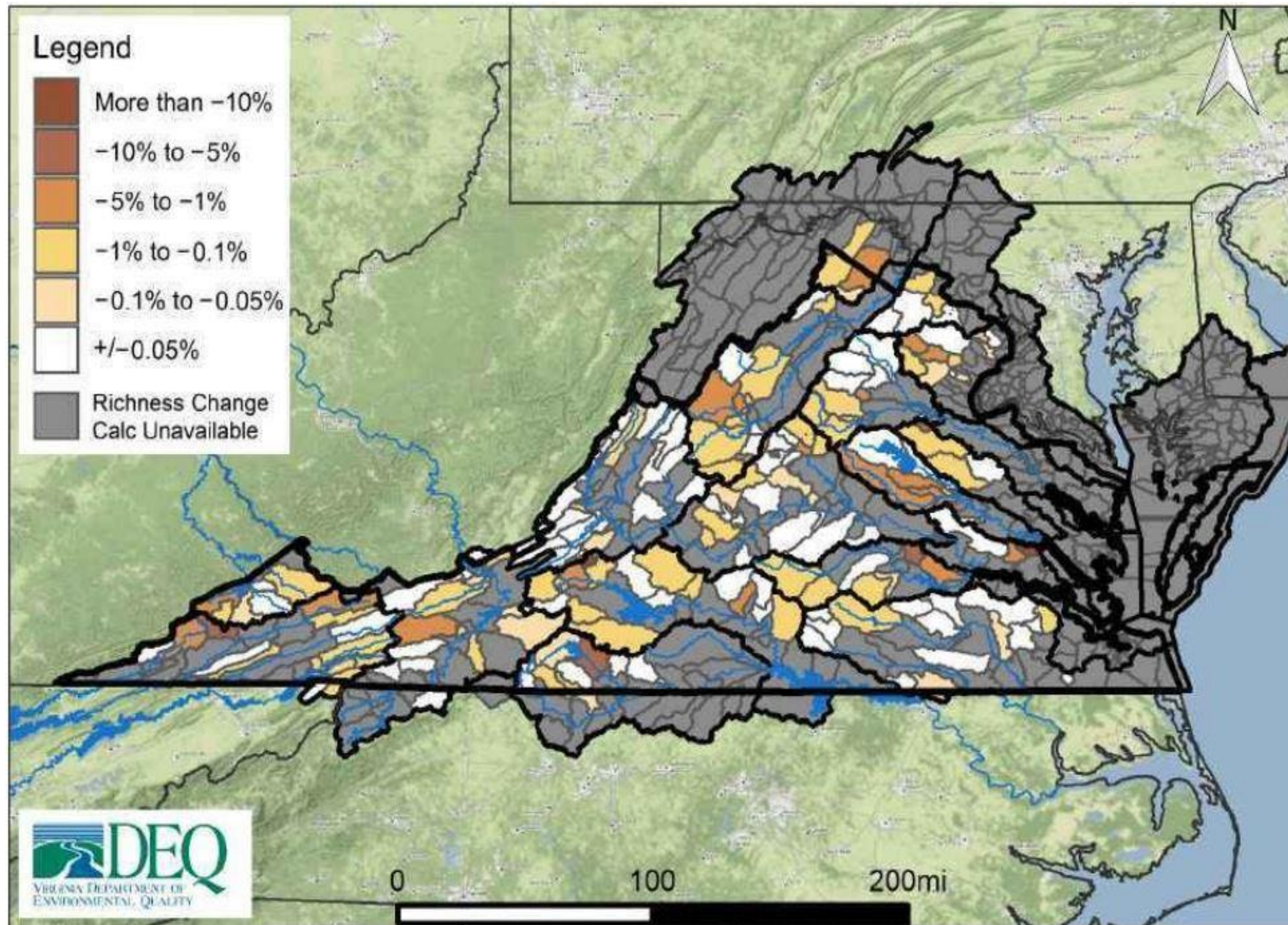
Percentile ranges for daily averages (means) for each day of a year (with comparison to normal)

|                        |                    |                       |                 |                       |                     |                           |
|------------------------|--------------------|-----------------------|-----------------|-----------------------|---------------------|---------------------------|
| 0-5<br>Extremely below | 5-10<br>Much below | 10-25<br>Below normal | 25-75<br>Normal | 75-90<br>Above normal | 90-95<br>Much above | 95-100<br>Extremely above |
|------------------------|--------------------|-----------------------|-----------------|-----------------------|---------------------|---------------------------|



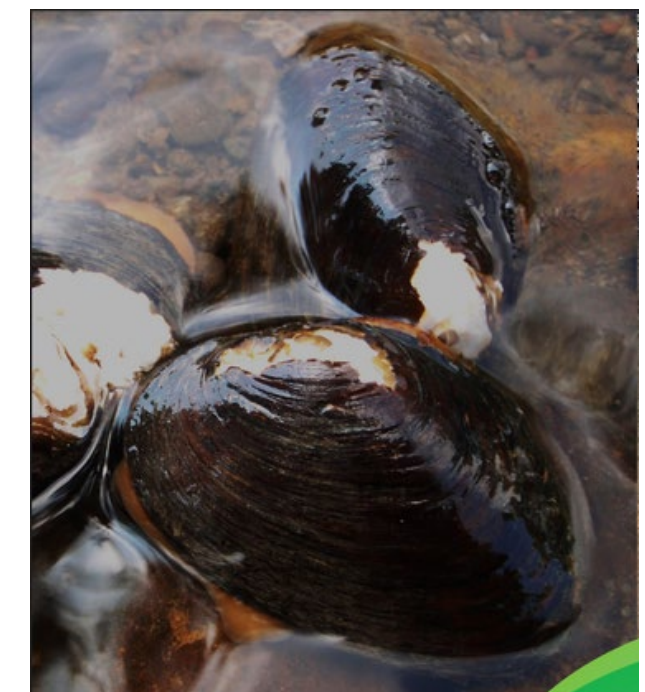
# 2020 State Water Resources Plan

## Species Richness - Stream Flows & Exempt User Scenario



## What happens then?

- Modelling shows impacts to species Richness
- Helpful snapshot, but can miss individual species impacts





# Summary & Outstanding Questions

- **Grandfathered Water Withdrawals Pose Challenges for Virginia's Water Future**
  - Solutions need to consider not simply withdrawal volumes and prioritization of use, but need to ensure water remains in streams to protect beneficial uses and habitat.
- **Concerns with Transferability of Surface Water Exemption**
  - Implications for Regulatory Avoidance & Water Supply Planning Complications
- **Emerging Demands Layered on Existing Water Use Landscape**
  - Concerns exist about marrying existing water withdrawal frameworks and grandfathering with emerging uses
- **With Changing Climate, Emerging Demands, and Minimal Regulatory Coverage, it is time to reconcile planning for Virginia's water future**