

How we mapped the Richmond Water Crisis

Jacob Hall and Daniel Schep, MapRVA

Richmond Water Crisis?

The New York Times

*Water Outage in Richmond, Va., Is
Expected to Last Until Friday*

**‘Faulty components and
faulty culture’: VDH says
Richmond’s water crisis was
decades in the making**

(ABC 8)

**Water outages disrupt Richmond-
area health care** (VPM / NPR)

STATION NAME:	Station
IS	Close to the Public
RELATED BY:	Only Train passenger are aloud in The building

Station Hours
 Mon – Sun 8:00am – 5:00pm
 subject to change for special events



velothorpe 5h

III Anime Zing • Perfect Cell's Theme (From "Dragon Ba...



Map of states who's capital has
 no water for its citizens





some_reddit_user · 5mo ago

I wish there were a map for this like how Dominion has maps of power outages.



212



Reply



Award



Share



(comment looked something like this...)



Daniel Schep 🏔️ 14:43

this is gonna be my hackiest project yet

Screen Shot 2025-01-08 at 14.43.25.png ▼

Richmond Water Outage Survey

Richmond DPU isn't publishing maps of where people don't have water like Dominion does with power outages, so we're crowdsourcing the data to make our own map so that the city can't hide how big a problem this was!



65 replies Last reply 5 months ago



Daniel Schep 🏔️ 14:44

back to real work now tho 😊



Jacob Hall 🏔️ 15:51

replied to a thread: [this is gonna be my hackiest project yet](#)

It is LIVE, here it is <https://arcg.is/1if9OT1>

survey123.arcgis.com

[Richmond Water Crisis Survey](#)

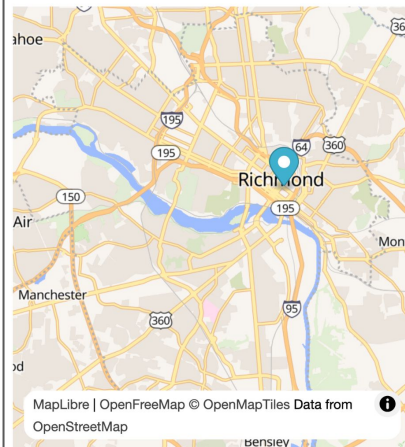
This is an unofficial survey by Richmond community members who want to better understand the extent of the January 2025 water crisis.



[View newer replies](#)


Richmond Water Outage Survey


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
Building the Survey

- ArcGIS Survey123
 - It's what we had!
 - Works well enough for simple stuff, but we quickly surpassed its capabilities
 - Not FOSS, so not an option we'd like to explore much further
- Reddit / Local news

 Add

 Edit

 Appearance

 Options

Date and time









↑↓

Label

When did you regain water?

≡

Hint



B I A        


Feel free to leave this question unanswered if you have not regained water.

Default value

☐ Submitting date and time

☐ Specified date and time

Calculation 

[Edit](#)

Use an expression to calculate the answer

Validation

☐ This is a required question

Survey Design

- Very strong disclaimer
- Promise to anonymize
- Couple of focused questions
 - To what extent did you lose water?
 - When did you lose water?
 - When did you regain water?
 - Any other notes you'd like to share?
- Translated to Spanish by request
 - This was a great idea, but we launched the Spanish version a bit late to get much reach
 - We had difficulty broadcasting to local Spanish-speaking orgs before the crisis was over

Richmond Water Crisis Survey

We would like to better understand who got hit the hardest by the water crisis in Richmond, and the timeline of when each region of our city was impacted. We are collecting data from the community to create a map of areas that experienced a loss of water.

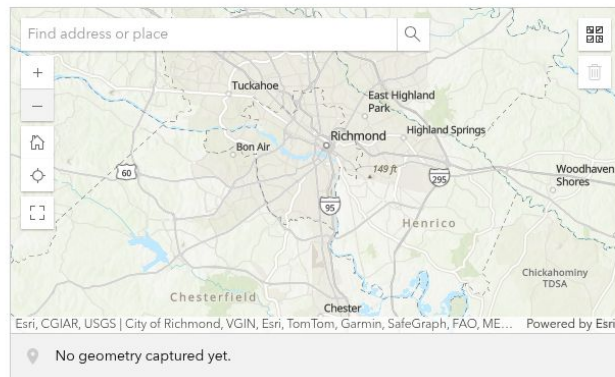
Learn more about MapRVA and our other community mapping efforts [here!](#)

By participating in this survey, you acknowledge that this is an entirely unofficial, community effort. This survey is in no way affiliated with City of Richmond or any government, academic, or registered business in the state of Virginia. This survey has not been reviewed by any IRB.

Where are you reporting from?*

On the map below, please zoom into the place you are reporting from (e.g. house or business), and select the location by clicking on it.

We will anonymize your location when sharing our results.



To what extent did you lose water?*

☐

Not at all, flow was normal

☐

Water pressure was reduced

Building the Map - Prepping the data

- Deduplicated data to ~10m
- Aggregated data to hex cells
- Aggregated data to city census blocks
- Computed mode & max per hex cell
- Computed mode per census block
- Computed median duration per severity
- Output computed data as GeoJSON



Building the Map - Rendering the data



PROTOMAPS

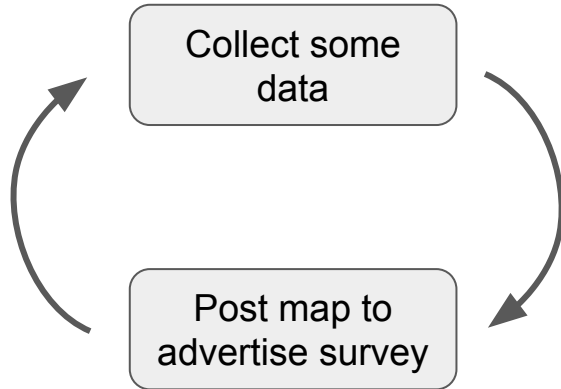
GitHub Pages



Dogwood

```
---
type: geojson
popupOnHover: true
popupTemplate: >
  ● &nbsp;{{ properties.sev1 }}&nbsp;
  ● &nbsp;{{ properties.sev2 }}&nbsp;
  ● &nbsp;{{ properties.sev3 }}&nbsp;
  ● &nbsp;{{ properties.sev4 }}
options:
  bounds: [-77.64038085937504,37.44433544620035,-77.35868453979496,37.60716014465312]
  attributionControl:
    compact: false
    customAttribution: '<a target="_blank" href="https://maprva.org">MapRVA</a>'
  controls:
    - type: HTMLControl
      position: bottom-left
      options:
        html: >
          <div>
            <b>Legend:</b>
            <br>
            ● Fully lost water
            <br>
            ● Water pressure decreased to a trickle
            <br>
            ● Water pressure noticeably decreased
            <br>
            ● No change in water pressure
            <br>
            <em>Each cell is colored by the most common response within it</em>
          </div>
        css: >
          div {
            background: white;
            padding: 5px;
          }
        style:
          extends: https://maprva.github.io/protomaps-ghpages/styles/grayscale/en.json
          sources:
            boundary:
              type: geojson
              data: https://maprva.github.io/2025-water-crisis/boundary.geojson
          layers:
            - type: line
              beforeLayerId: places_subplace
              source: boundary
              line-width: 2
            - type: fill
              beforeLayerId: places_subplace
              fill-opacity: 0.5
              fill-color:
                - case
                - [==, [get, sev], 4]
                - green
                - [==, [get, sev], 3]
                - yellow
                - [==, [get, sev], 2]
                - orange
                - [==, [get, sev], 1]
                - red
                - grey
---
https://maprva.github.io/2025-water-crisis/mode_severity.geojson
```

Data Feedback Loop



← Get Involved!

Mapping the Jan 2025 Water Crisis

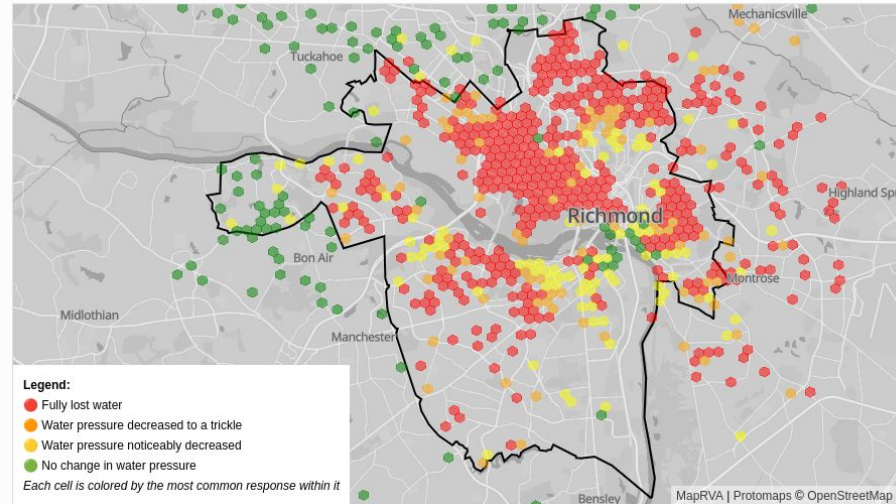
We are creating maps of where and when the water crisis affected Richmonders.

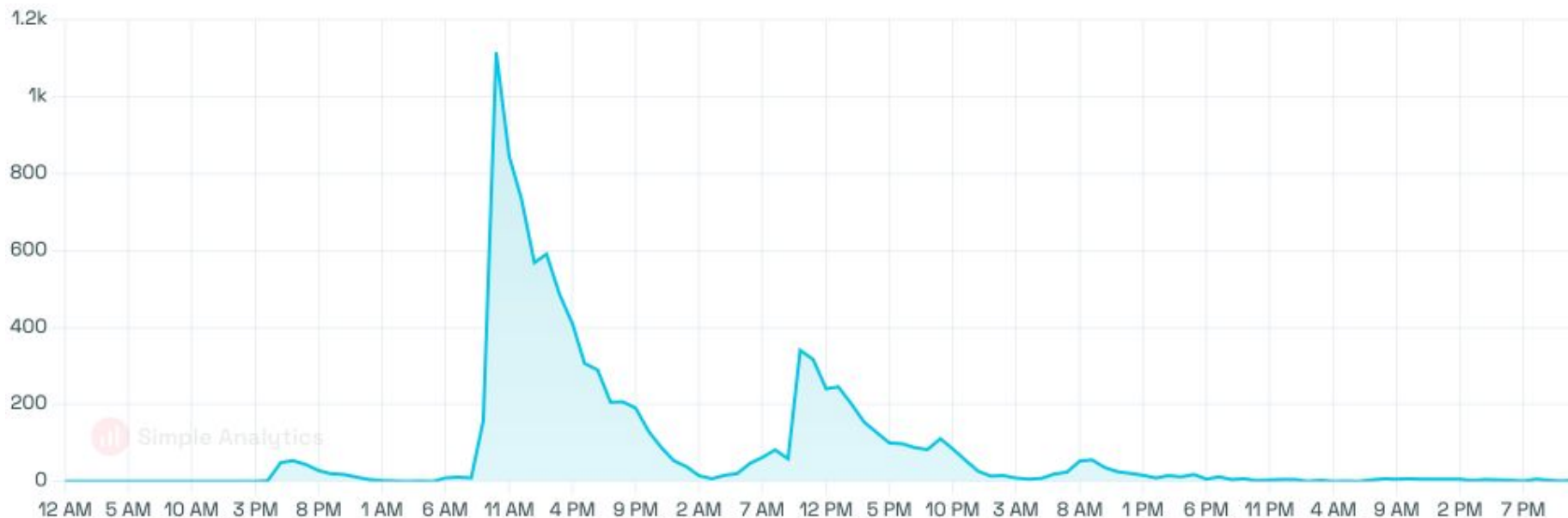
[Take the Survey!](#)

The survey is still open [at this link \(Español\)](#). We want to share this survey with underrepresented communities in RVA, please [get in touch](#) if you can help.

Most Common Degree of Water Loss

In this map each cell is colored by the most commonly reported status in the cell. *Hover or tap a cell to see how many of each type of report was submitted for that area.*

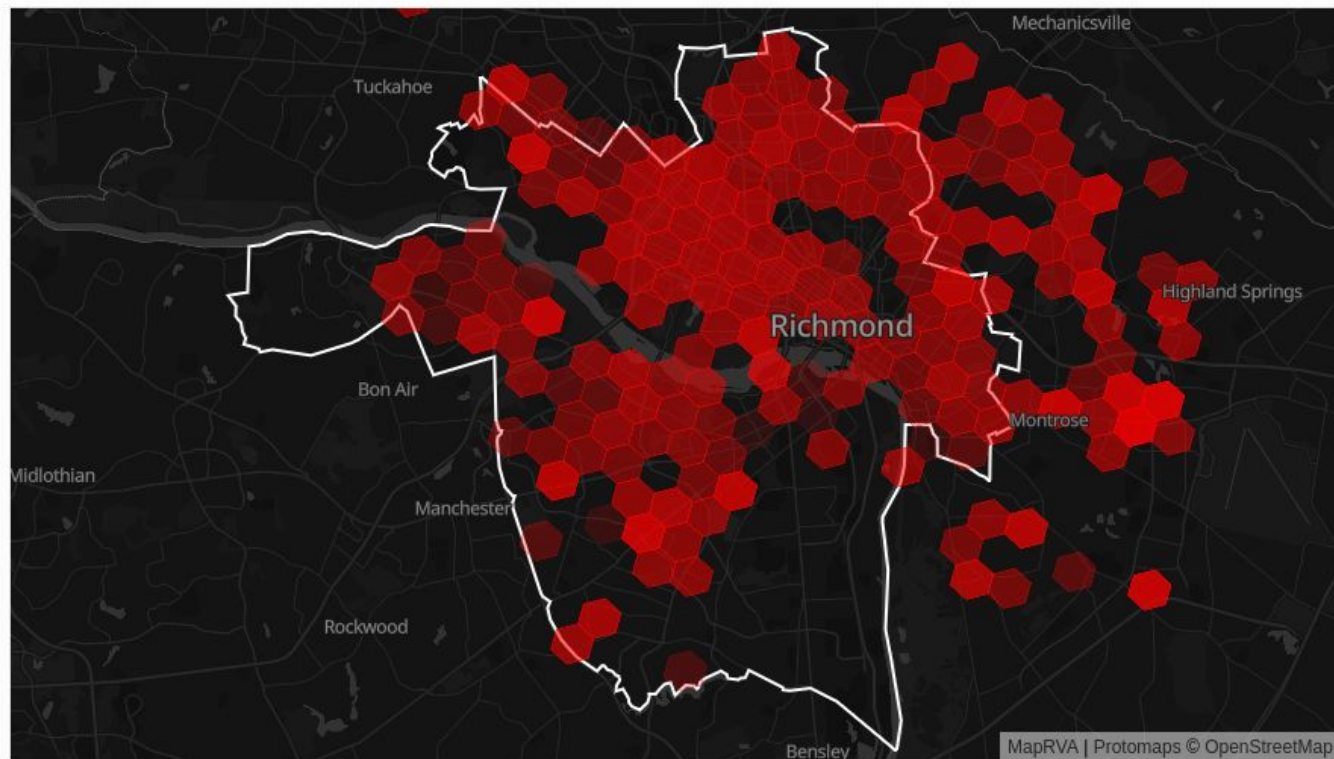




Hourly pageviews for maprva.org during our peak. Our January total topped 10k.

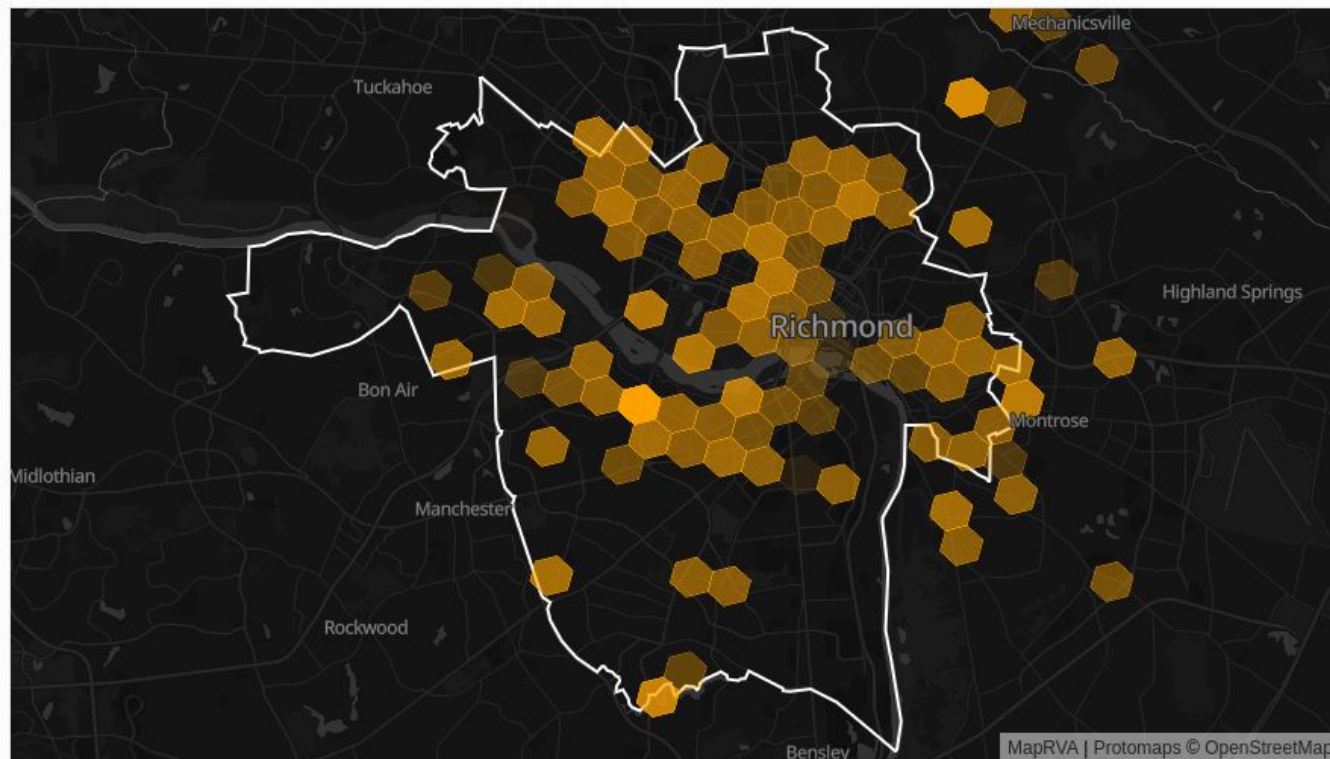
Average Duration of “Fully Lost Water”

Hover or tap a cell to see the number of hours and reports for that area. Level of detail shown will adjust by zoom level.



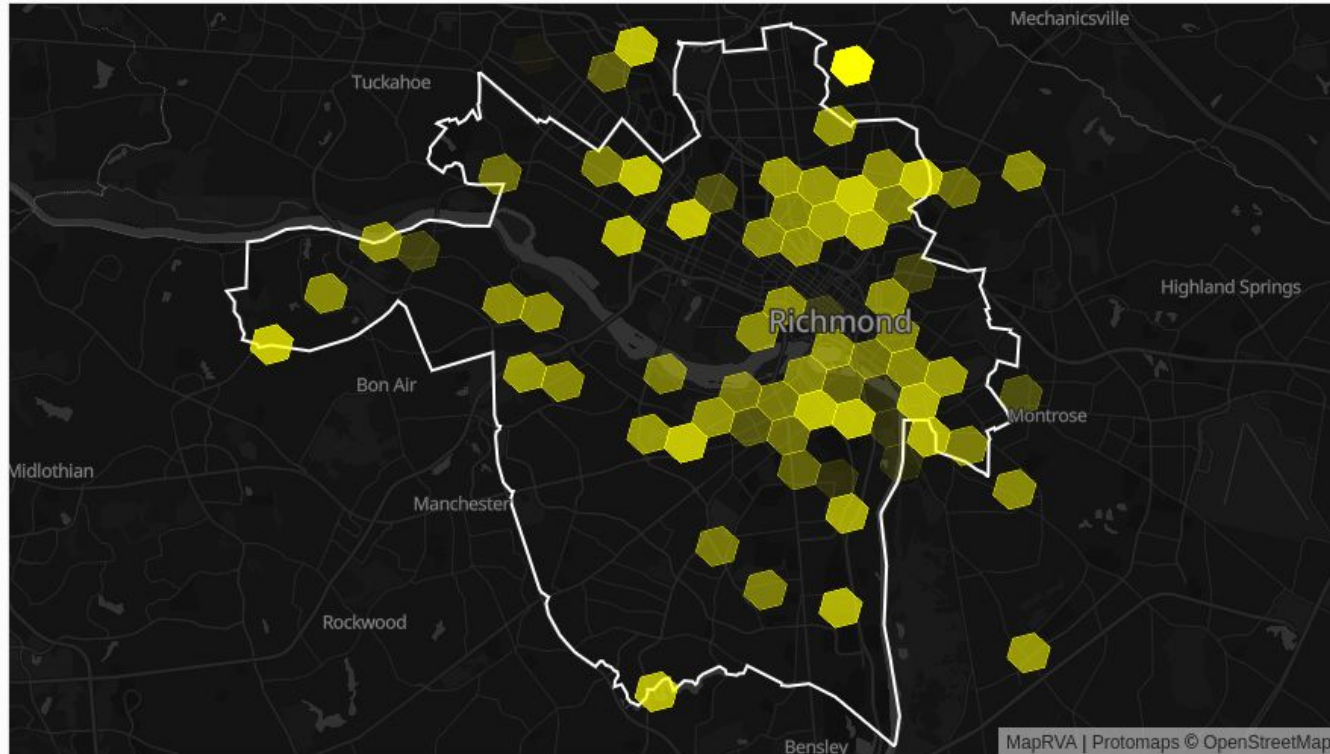
Average Duration of “Down to Just a Trickle”

Hover or tap the cells to see the number of hours and reports for that area. Level of detail shown will adjust by zoom level.



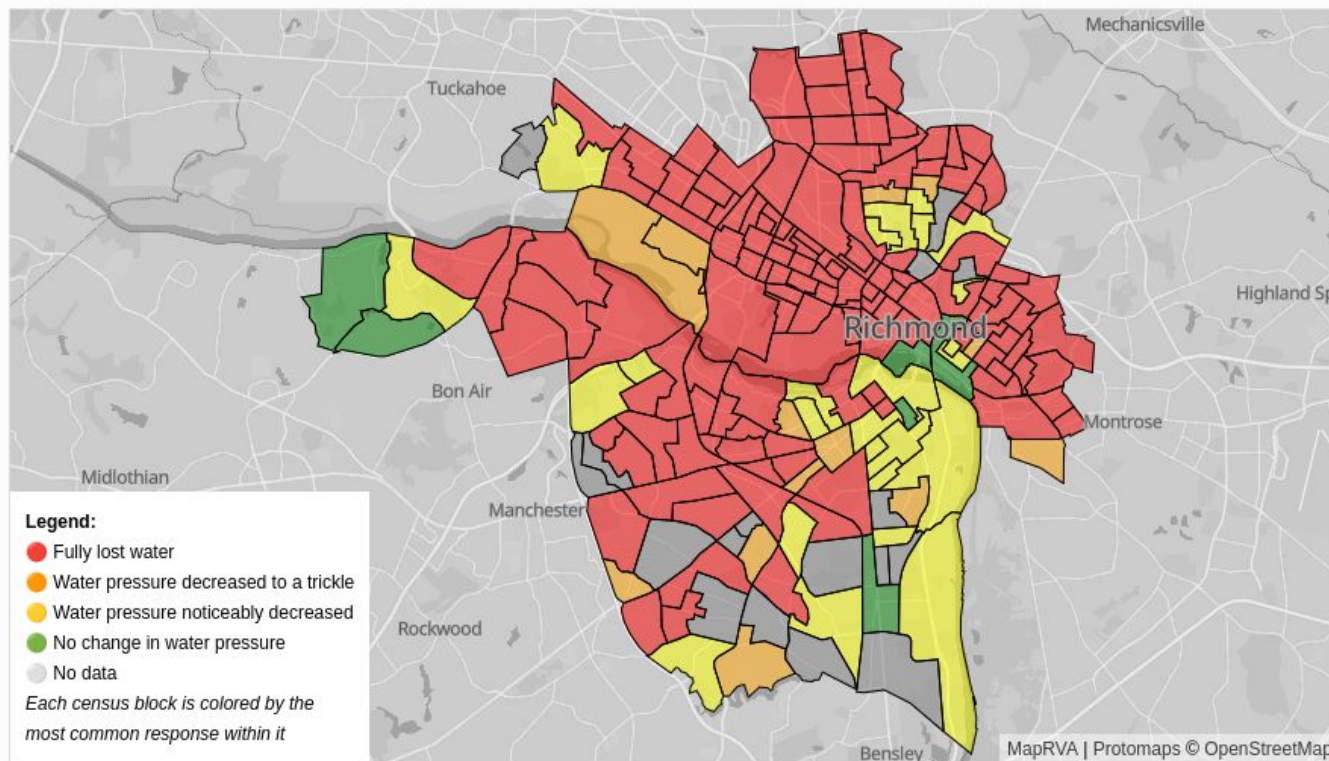
Average Duration of “Water Pressure was Reduced”

Hover or tap a cell to see the number of hours and reports for that area. Level of detail shown will adjust by zoom level.



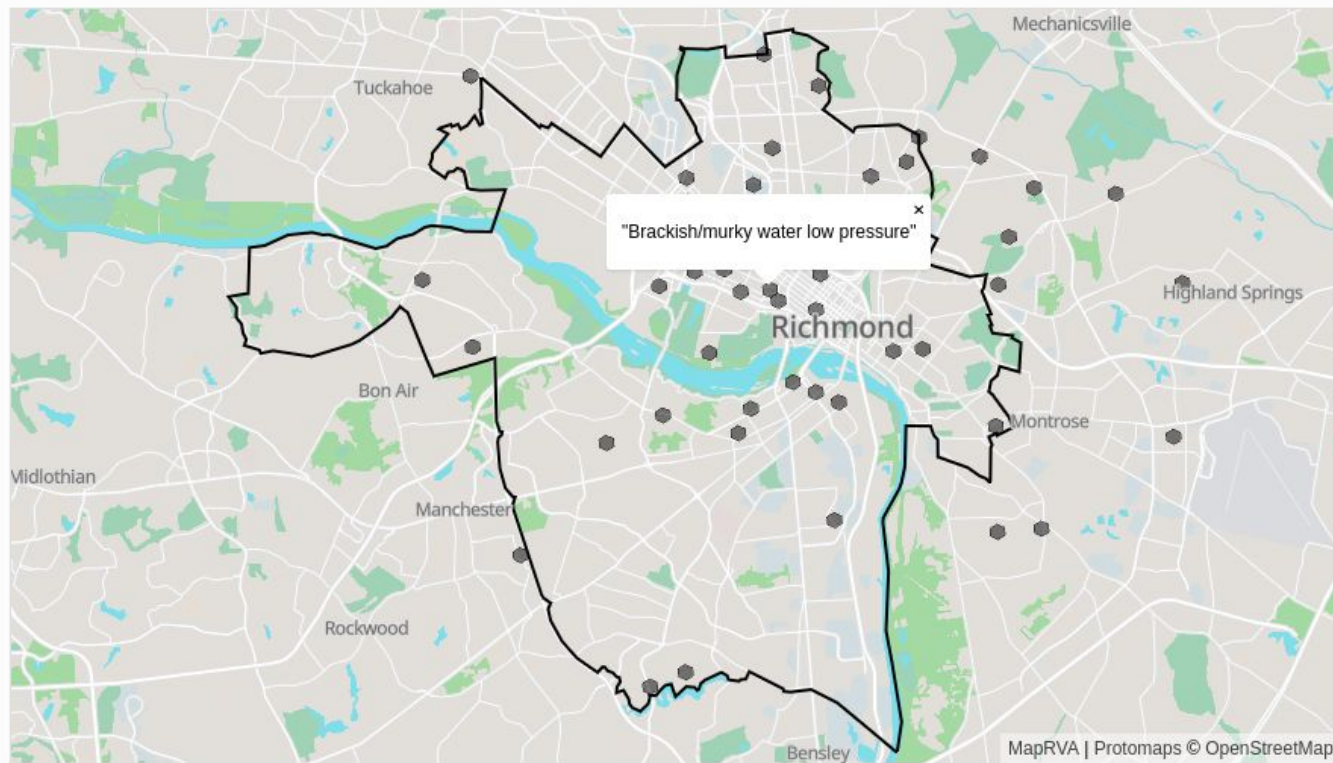
Most Common Degree of Water Loss by Census Block

In this map each census block is colored by the most commonly reported status within it. *Hover or tap a census block to see how many of each type of report was submitted for that area.*



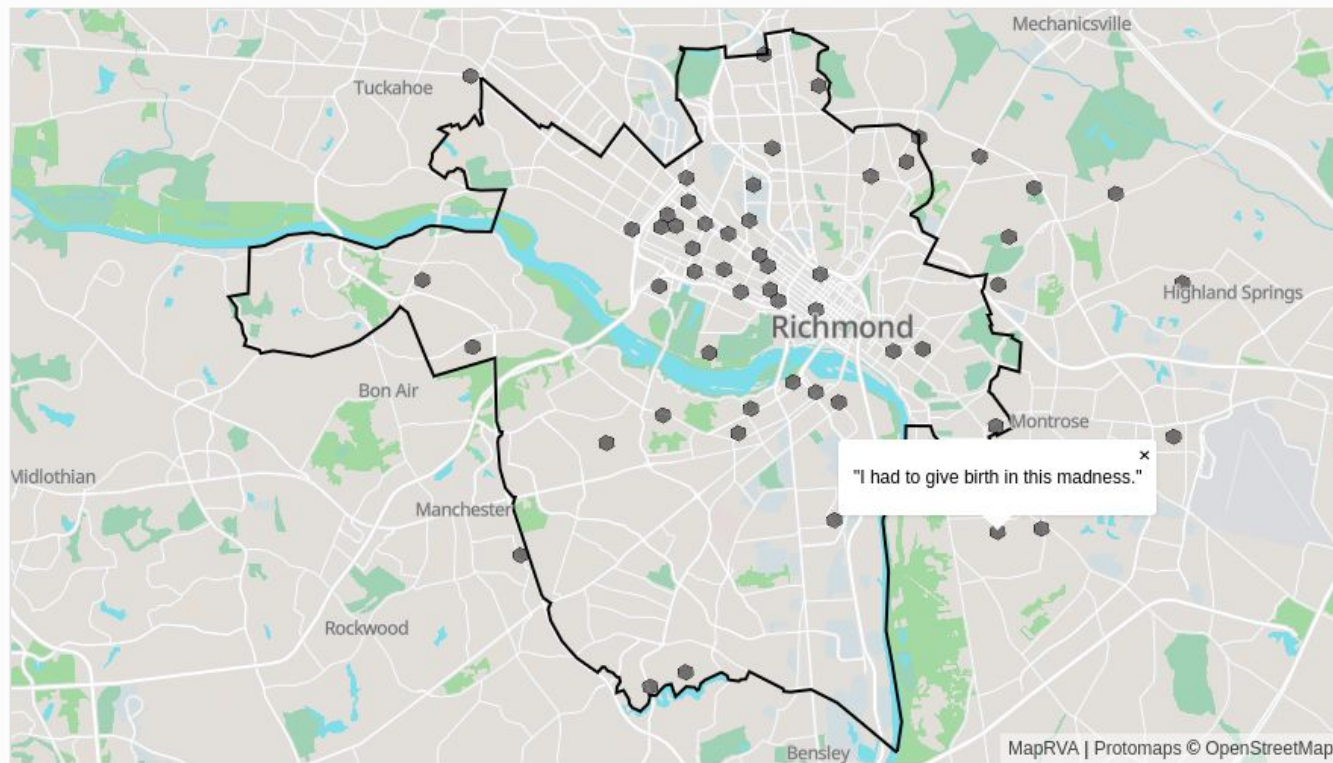
The Richmonders Are Not Alright

Our survey yielded many thoughtful comments, and some humorous ones. Here's a look at how Richmond is feeling during the water crisis. *Tap or hover over a cell to view a quote from that area.*



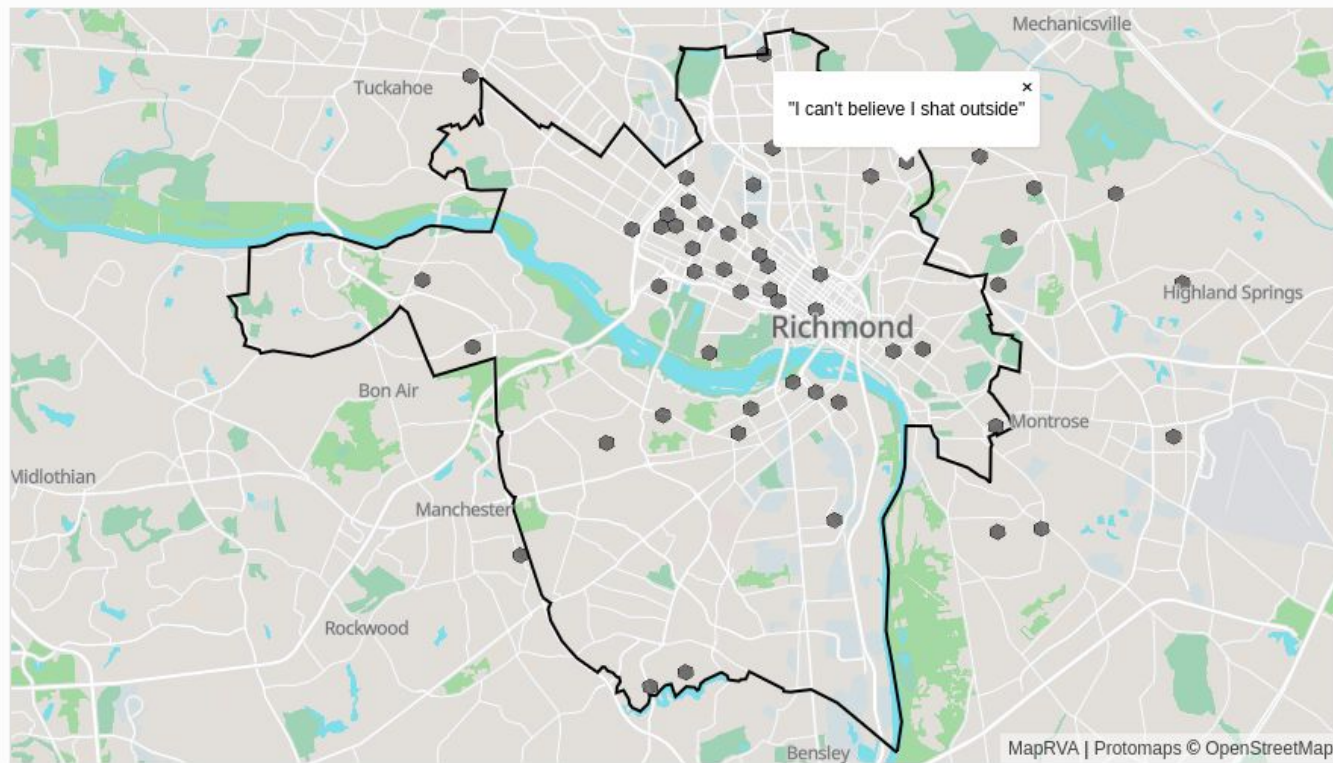
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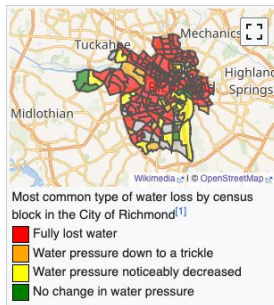
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Lasting Impact

- Engagement fell quickly after water was restored
- MapRVA has seen a sustained increase in membership, though!
- We helped export our map for a Wikipedian writing an article on the crisis



About Submit A Tip

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The Church Hill Lookout > Posts > New RVA maps unlocked

New RVA maps unlocked

Plus: Did you spot the sneekdowns?



Dave Infante

February 07, 2025

6



Mapping Pedestrian Infrastructure

We are mapping every sidewalk and pedestrian crossing in Richmond.



Mapping the Jan 2025 Water Crisis

We are creating maps of where and when the water crisis affected Richmonders.

← Get Involved!

Surveillance Devices


Mapping the surveillance state we all live in. Cameras, ALPRs, & gunshot detectors.



Thanks!

- Visit our website!
- #local-rva on Slack




 **MapRVA**

[About Us](#) [Get Involved!](#) [Member Projects](#)

MapRVA

We are a group of mapping enthusiasts in Richmond, Virginia who work to create and share geospatial data of our city using [OpenStreetMap](#).


Featured Work



Water Crisis

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Meetups