



New Jersey Water Risk & Equity Map and Jersey WaterCheck:
*Related tools show where the lead pipes are and where
funding is needed most*



ABOUT JERSEY WATER WORKS

[Jersey Water Works](#) (JWW) is a collaborative composed of a diverse group of members. It is a virtual organization rather than a legal entity. Jersey Water Works is working to transform New Jersey's inadequate water infrastructure through sustainable, cost-effective solutions that provide communities with clean water and waterways; healthier, safer neighborhoods; local jobs; flood and climate resilience; and economic growth. New Jersey Future staff serve as the "backbone" for Jersey Water Works, coordinating the collaborative's day-to-day activities in support of its shared purpose. New Jersey Future is also a member of JWW, and its executive director is a member of the Steering Committee. [New Jersey Future](#) is a nonprofit, nonpartisan organization that promotes sensible and equitable growth, redevelopment, and infrastructure investments to foster healthy, strong, resilient communities; protect natural lands and waterways; increase transportation choices beyond cars; provide access to safe, affordable, and aging-friendly neighborhoods; and fuel a strong economy for everyone.

CONTENTS

| | |
|--|-----------|
| The Problem The Tools Are Solving | 4 |
| Jersey WaterCheck | 5 |
| New Jersey Water Risk and Equity Map | 11 |
| Relevant Layers | 11 |
| How it Works | 11 |
| Illustrative Examples | 18 |
| Statewide Data for Individual Water Systems | 20 |
| Why This Approach is Needed | 21 |
| Potential Impact if Widely Adopted | 21 |

The Problem The Tools Are Solving

The time to remove lead pipes across New Jersey to protect our children from the risk of permanent physical and psychological damage from lead exposure is now. Across the state, there is momentum building in terms of the commitment to remove lead in drinking water. The enactment of a new law (P.L. 2021, c.183) last summer requires public community water systems to inventory and replace lead service lines within 10 to 15 years.

Generally, New Jersey's State Revolving Fund (SRF) program, the New Jersey Water Bank, has offered a small number of highly subsidized loans to drinking water systems that have a median income below the statewide median. Under this program, roughly half of all drinking water systems may access state subsidies and do so regardless of the extent of their ratepayers' financial stress or the number of lead service lines. Now, not only is a new lead service line replacement requirement in place, but the State also has access to over \$6 billion in American Rescue Plan funds—a portion of which may be allocated to water-related projects—and will be receiving \$48.3 million per year over the next five years (totaling \$241.5 million) through the Drinking Water State Revolving fund specifically for lead service line replacement. This raises the question of how those funds should be allocated.

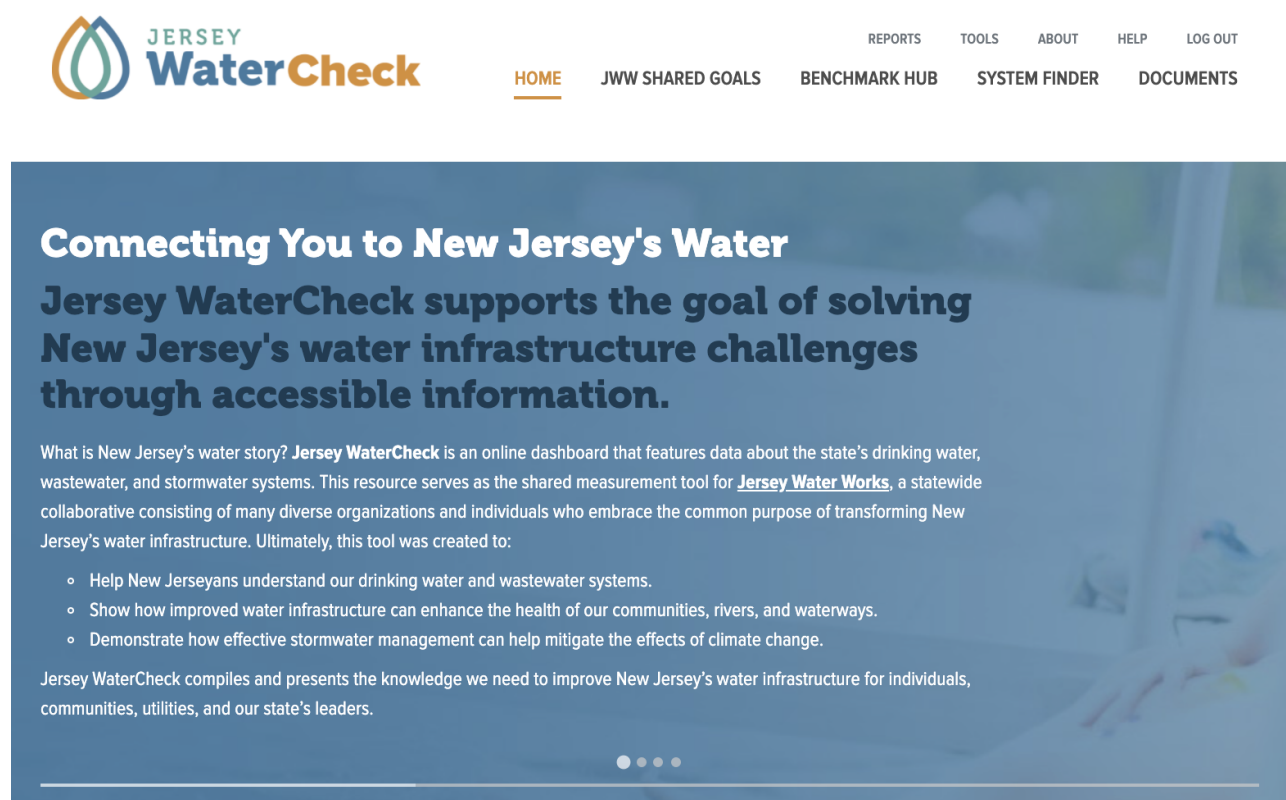
By providing an overlay visualization of [Jersey WaterCheck](#) metrics on the number of lead service lines, the utilities with action level exceedances for lead, and the percent of households in a utility service area that are likely to be unable to afford their utility bills, the [New Jersey Water Equity Risk Map](#) provides actionable information for state policy makers and local communities on how to center equity when making decisions that guide the design of funding programs for lead service line replacement. Both online tools are easily accessible by utilities, consumers, and advocates.

Jersey WaterCheck

[Jersey WaterCheck](#) (JWC) is an online tool created by [Jersey Water Works](#), a statewide collaborative working on New Jersey’s water infrastructure challenges. This innovative tool is meant to serve as the collaborative’s shared data measurement system. The ultimate goal is for utilities, consumers, and advocates to engage with the data and use it to learn more about water systems in New Jersey and/or inform their efforts to improve them.

Data that was gathered for display on this tool were used to create the relevant layers in the New Jersey Water Risk and Equity Map. JWC has the data available in downloadable spreadsheets that can be manipulated to then refine the mapping (and also for follow-up data analysis).

Pictured: The home page, which also includes short, illustrative videos (not pictured, right below the orange boxes) that explain the website and a few of the specific metrics.




JWW Shared Goals




Go here to learn about Jersey Water Works shared goals.

Benchmark Hub



Go here to find data on a variety of measures.

System Finder



Looking for a specific water or wastewater system or don't know who serves you? Go here to find it.

Pictured: The Benchmark Hub page featuring the metric, “Number of drinking water service lines reported to be made of or contain lead, including unknown (system-level),” with the mouse hovering over a bar representing a single drinking water system.

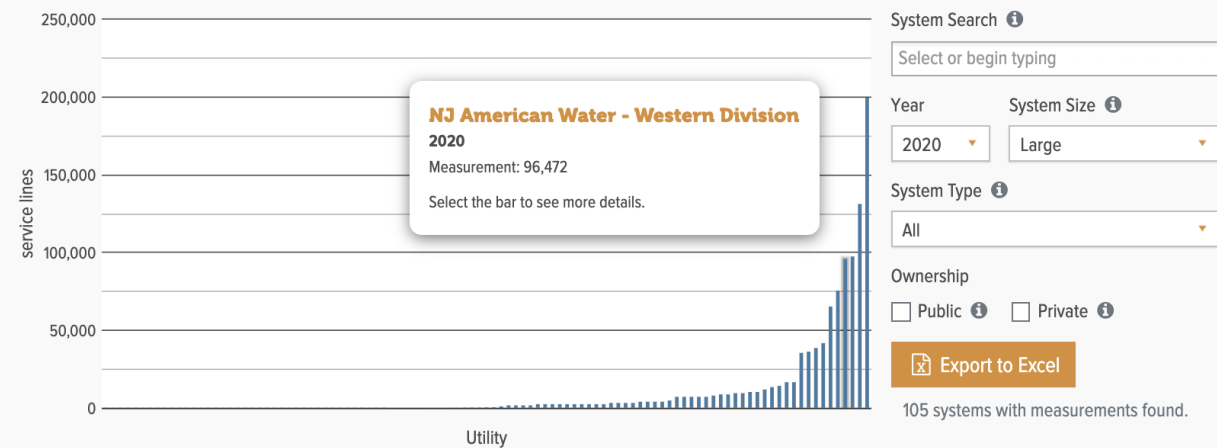
Number of drinking water service lines reported to be made of or contain lead, including unknown (system-level)

At an individual system level, this metric shows the number of service lines within the drinking water system's service area that are comprised of or contain some level of lead in the utility-owned and/or property-owned sections, based on drinking water system reports submitted to NJDEP. Generally, service lines refer to the pipes that deliver water from the water main to an individual building.

Note: The 2020 value includes the number of lead service lines with lead pipe or that are lead-lined, as well as lines with lead goosenecks. It also includes estimates that are classified as "Unknown" in the original data, which represent systems that do not know the exact number of lead service lines they have. Per the LSL replacement law signed in July 2021, galvanized service lines will now be counted as lead service lines. Thus, the LSL data reported next year (2022) will likely increase due to the counting of galvanized pipes. Generally, an increase in the number of known lead service lines (LSLs) reported over time indicates positive progress by the water system in identifying LSLs. Generally, a decrease indicates progress in removing LSLs. However, it is important to note that, over the course of one year, the number of known LSLs might increase and some might also be replaced, which could offset the increase. To see more information, visit [NJDEP Drinking WaterWatch](#).

Data Source: NJ Department of Environmental Protection (NJDEP)

[Click here see the related state-level measure.](#)



Pictured: The Benchmark Hub page featuring the metric, “Utility sampling round of residential drinking water did not equal or exceed EPA action levels for lead (system-level),” with the mouse hovering over a bar representing a single drinking water system.

Utility sampling round of residential drinking water did not equal or exceed EPA action levels for lead (system-level)

This measure is a regulatory requirement.

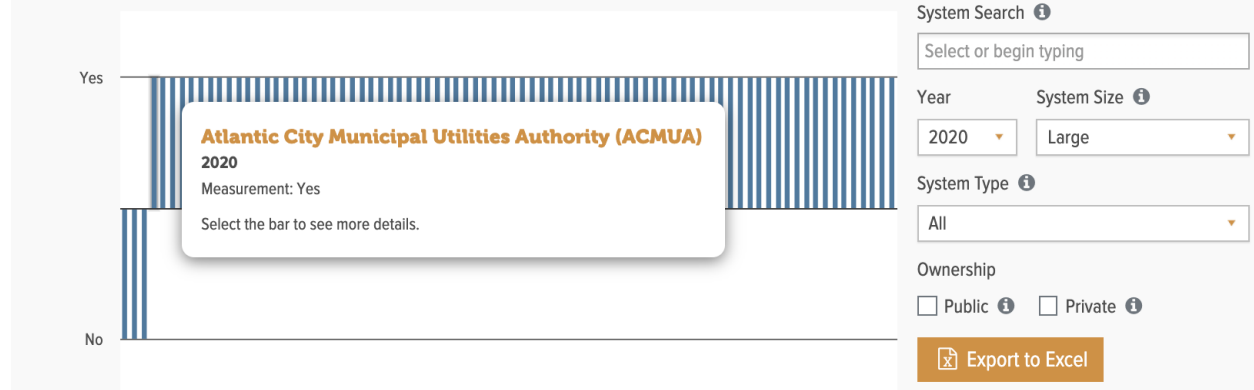
At an individual system level, this metric shows whether the system has not exceeded the US EPA Action Level for lead in any sampling round in the most recent calendar year in accordance with the federal Lead and Copper Rule (LCR). The LCR requires that utilities sample drinking water in residences of high risk for lead (or other customers if insufficient high-risk households are available). The utility is required to take action if the 90th percentile result (e.g., for 100 samples, the 10th highest result) exceeds 15.5 parts per billion (ppb) of lead. Note that a water system can have a small number of samples above the action level, but not incur an action level exceedance if the 90th percentile level is below 15.5 ppb. Different systems have different monitoring schedules, ranging between semiannual, annual, or triennial, based on different factors related to that system’s specific history. All federal drinking water regulations are automatically adopted into New Jersey regulations by reference.

For the purpose of this dashboard, a “Yes” response indicates that there was no action level exceedance (ALE). A “No” response indicates that the system was reported by NJDEP to have had at least one instance of an ALE. When systems do not have a value for a given year, it means that they were not required to sample that year, likely because they are on a triennial sampling schedule.

Note: Data for this metric is only reporting on lead and not copper. The information for this metric is updated annually using data from NJDEP, so it may not represent current conditions. Utilities may have already resolved or started to resolve issues identified. To learn more, please read the relevant individual system’s Consumer Confidence Report (CCR) (found on the system page) or visit [NJDEP Drinking WaterWatch](#) for additional details that this dashboard does not provide.

Data Source: NJ Department of Environmental Protection (NJDEP)

[Click here see the related state-level measure.](#)



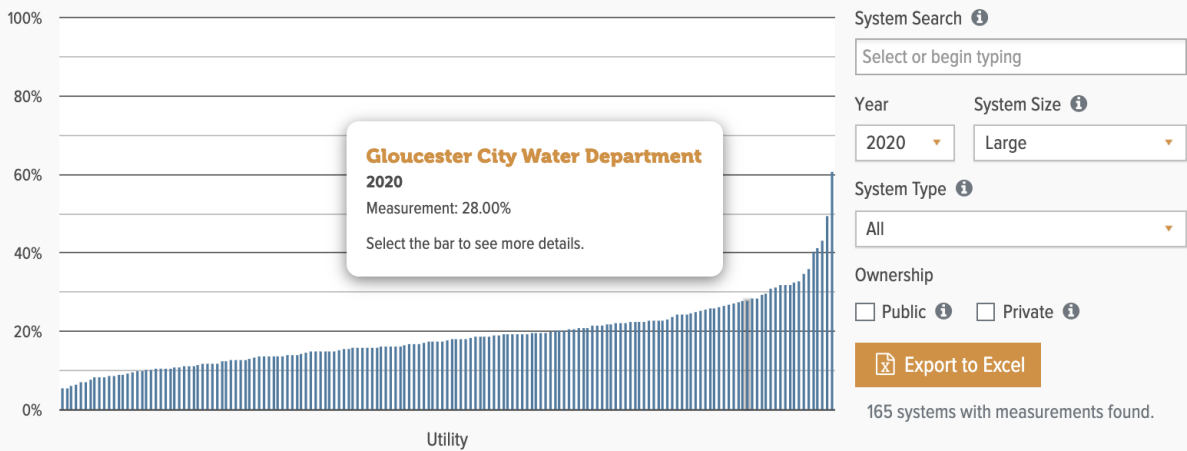
Pictured: The Benchmark Hub page featuring the metric, "Percentage of households that may struggle to pay water and sewer utility bills (system-level)," with the mouse hovering over a bar representing a single drinking water system.

Percentage of households that may struggle to pay water and sewer utility bills (system-level)

At an individual system level, this metric shows the percentage of households in the system's service area that may have difficulty paying water and sewer bills in the absence of subsidies. This metric is based on research from "A New Jersey Affordability Methodology and Assessment for Water and Sewer Utility Costs" (Van Abs, 2021) comparing 2020 water and sewer rates for both systems to the income of households at the top of the lowest quintile (20th percentile) of household incomes for each area, recognizing the cost of other typical household expenses. (See the Documents Library page for this report.) Information in this metric can help systems and communities to identify opportunities to provide assistance to low-income customers.

Data Source: Research

[Click here see the related state-level measure.](#)



Pictured: The “System Finder” page, that allows users to find a particular drinking water or wastewater system using either an interactive map and/or a search by name, municipalities served, etc.

Understand New Jersey’s water.

Learn more about the water and wastewater systems that serve New Jerseyans.

This System Finder gives consumers a direct link to their drinking water provider, and the agency that cleans the wastewater we create.

On the map below, each colored dot indicates a system. Click on a dot to learn more about that system. The larger grey circles with numbers indicate clusters of systems. Click on these circles to zoom in and see the individual systems.

When a system’s dot is clicked, its service area will appear shaded. For wastewater systems, the system’s discharge location(s) will also appear as small red points.

System Search

Municipalities Served

System Type ⓘ

System Size ⓘ

Ownership
 Public ⓘ Private ⓘ

1107 systems found.

Legend:
● Water Only ● Wastewater Only ● Water & Wastewater ● Municipality ● Discharge Site

Pictured: An example of a drinking water system page, which features the location of the system on a statewide map and basic information, such as municipalities served and a link to the system's website. The system page also includes metric cards (not pictured) that display relevant data for the individual system.

NJ American Water - Raritan

Water / Private Utility - Corporate owned and operated / Est. Population Served: 736,791

Public Water System ID: NJ2004002

Associated Municipalities: Bound Brook Borough, Branchburg Township, Bridgewater Township ... [\(show 45 others\)](#)

Drinking Water Sources: Millstone River, upper Potomac-Raritan-Magothy aquifer, Raritan River, middle Potomac-Raritan-Magoth ... [\(more\)](#)

Note: Some systems may also purchase water from elsewhere. To find more information, look up your system in this NJDEP database [here](#).

<https://amwater.com/njaw/>



Welcome to New Jersey American Water. We know just how important water is to daily life. It's somehow involved in everything thing we do, everything we use. When you need it, you expect it to be there — and you expect it to be clean and safe. That's what our skilled teams of experts care about most and focus on every day. Our customers are our number one priority, and we are proud to deliver clean, safe, reliable and affordable water and wastewater services. In New Jersey we serve about 2.7 million people. To ensure your water is of the highest quality, we strictly follow regulations that are set by local authorities as well as federal standards set by the United States Environmental Protection Agency (USEPA). Water is an integral part of life, and we take great pride in taking care of it.

To see your system's Water Quality Report or Consumer Confidence Report, [click here](#).



- Water Only
- Wastewater Only
- Water & Wastewater
- Municipality
- Discharge Site

New Jersey Water Risk and Equity Map

The [New Jersey Water Risk and Equity Map](#) is an interactive online map, hosted by Rutgers University, that was created by [Jersey Water Works](#) to show the overlay of water risks and demographic factors. The map draws upon data compiled by New Jersey Future for Jersey WaterCheck. The ultimate purpose of this tool is to help address inequities in water risk exposure.

Relevant Layers

The following three datasets were each mapped using the base shapefile: [New Jersey Public Community Water Purveyor](#) service areas. This layer is publicly available through the New Jersey Geographic Information Network ([NJGIN](#)).

- **Estimated Lead Service Lines by Water Service Area:** The estimated number of service lines within the public community water system's service area that are comprised of or contain some level of lead in the utility-owned and/or property-owned sections, according to reports submitted by public community water systems to the New Jersey Department of Environmental Protection (NJDEP) in 2020.
 - Source: NJDEP ([Link to relevant Jersey WaterCheck page](#))
- **Areas Served by Water Systems with Lead Action Level Exceedances:** Public community water systems that exceeded the US EPA Action Level for lead in any sampling round in 2019 in accordance with the federal Lead and Copper Rule (LCR).
 - Source: NJDEP ([Link to relevant Jersey WaterCheck page](#))
- **Water and Sewer Affordability Stress by Water Service Area:** The percentage of households within the public community water system's service area that may struggle to pay water and sewer utility bills in a given drinking water service area. This innovative analysis overlays census tract data with utility service areas, enabling statewide comparisons.
 - Source: [A New Jersey Affordability Methodology and Assessment for Drinking Water and Sewer Utility Costs](#) ([Link to relevant Jersey WaterCheck page](#))

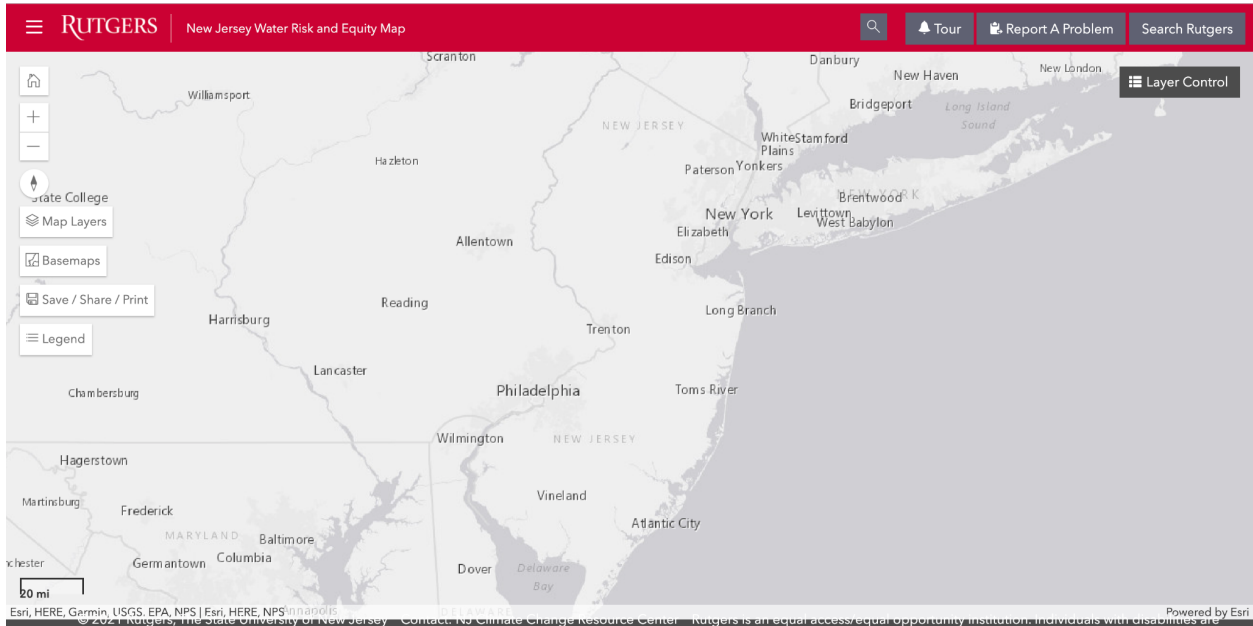
How it Works

The following screenshots show how to view the three relevant layers on the New Jersey Water Risk and Equity Map with accompanying text instructions, including how to:

- Toggle a layer on/off or remove it
- Access the legend for the layer
- Adjust the transparency of a layer
- Save, share, or print the map

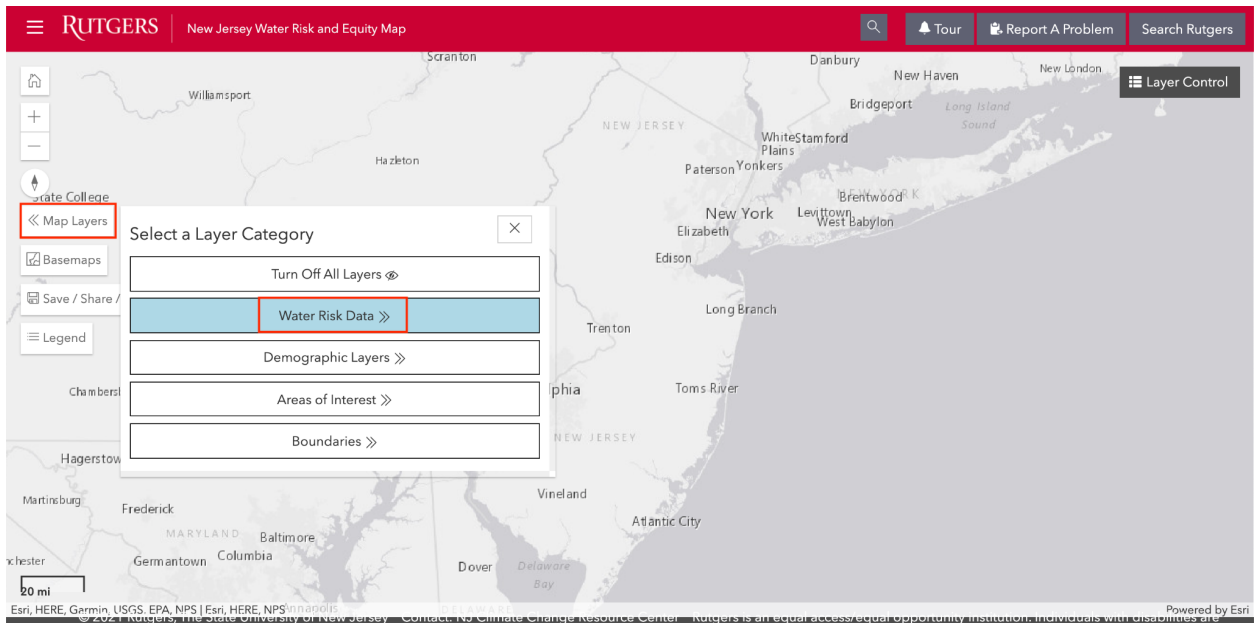
Following these illustrations is a sample report of the underlying data that can be downloaded from Jersey WaterCheck.

1) Navigate to the home page (<https://njwaterequity.rutgers.edu/>).

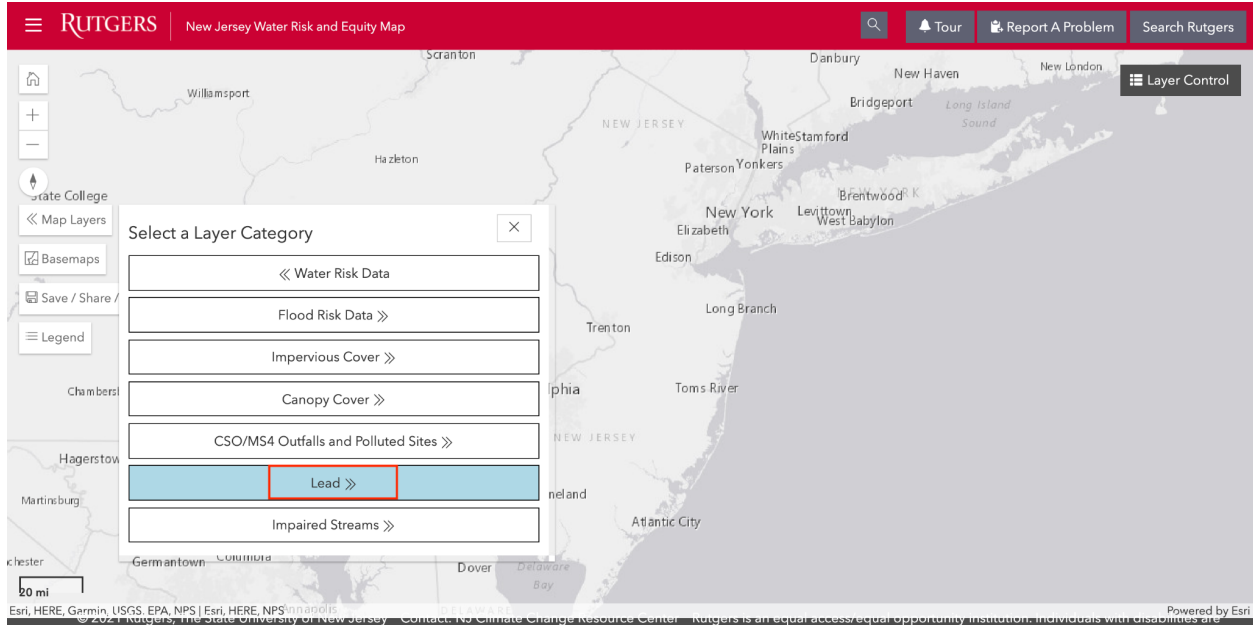


2) To see the two lead-related layers:

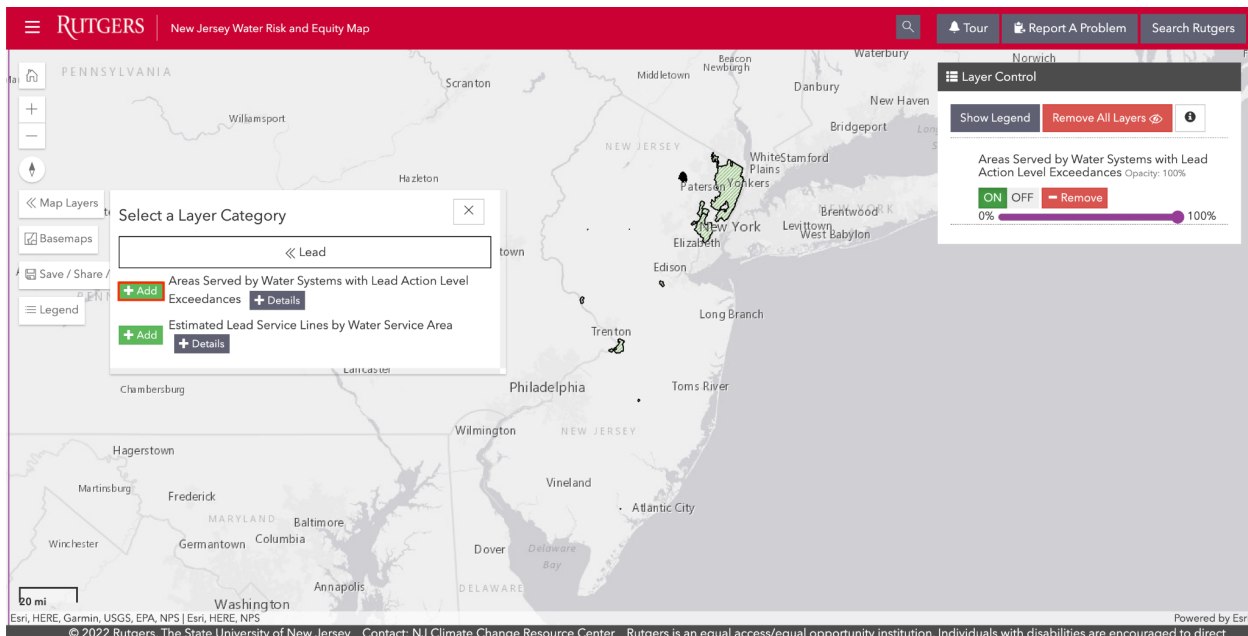
A) Select the “Map Layers” box, and then “Water Risk Data” from the list.



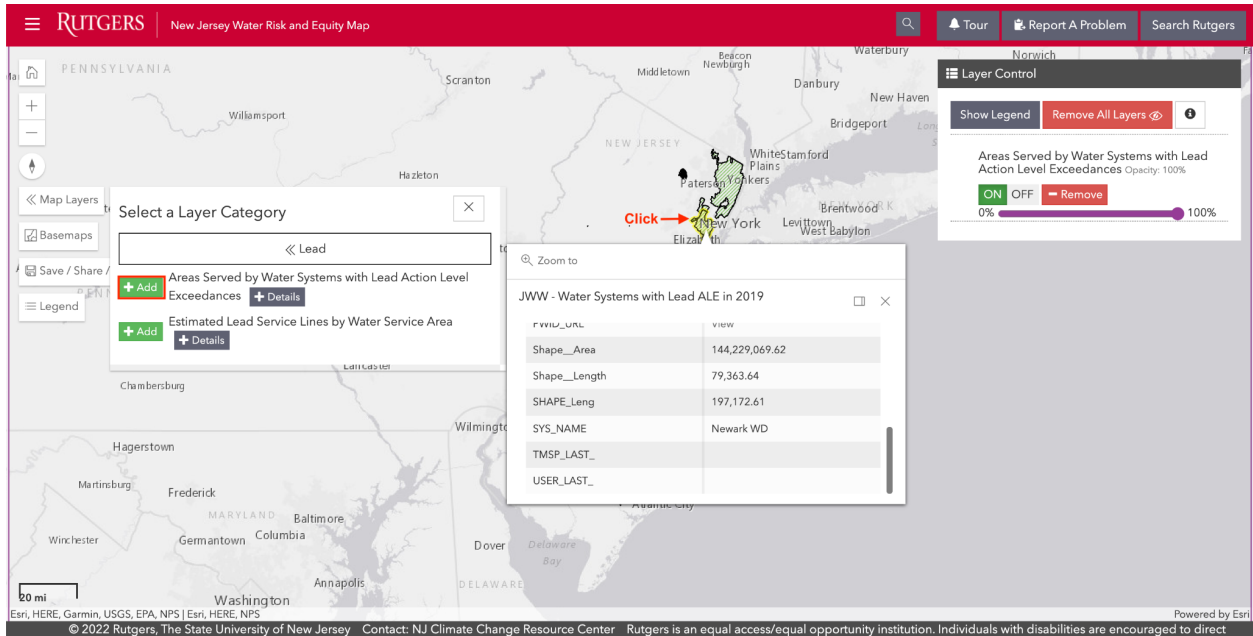
B) Select “Lead” from the list.



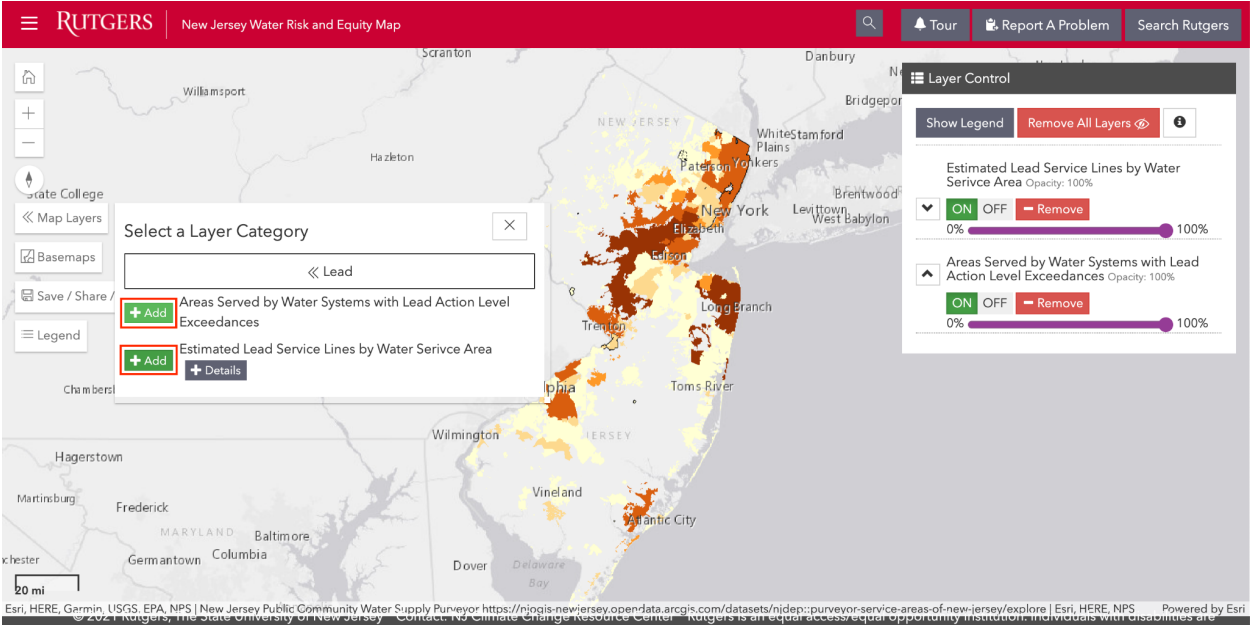
- C) Select the “+ Add” button to add the relevant layer to the map.
- Within the “Layer Control” window, you can manipulate a layer:
 - Toggle between “ON” and “OFF”
 - Click the “- Remove” button
 - Adjust the transparency by clicking/dragging on the sliding scale



C1. The screenshot above shows adding just one layer.

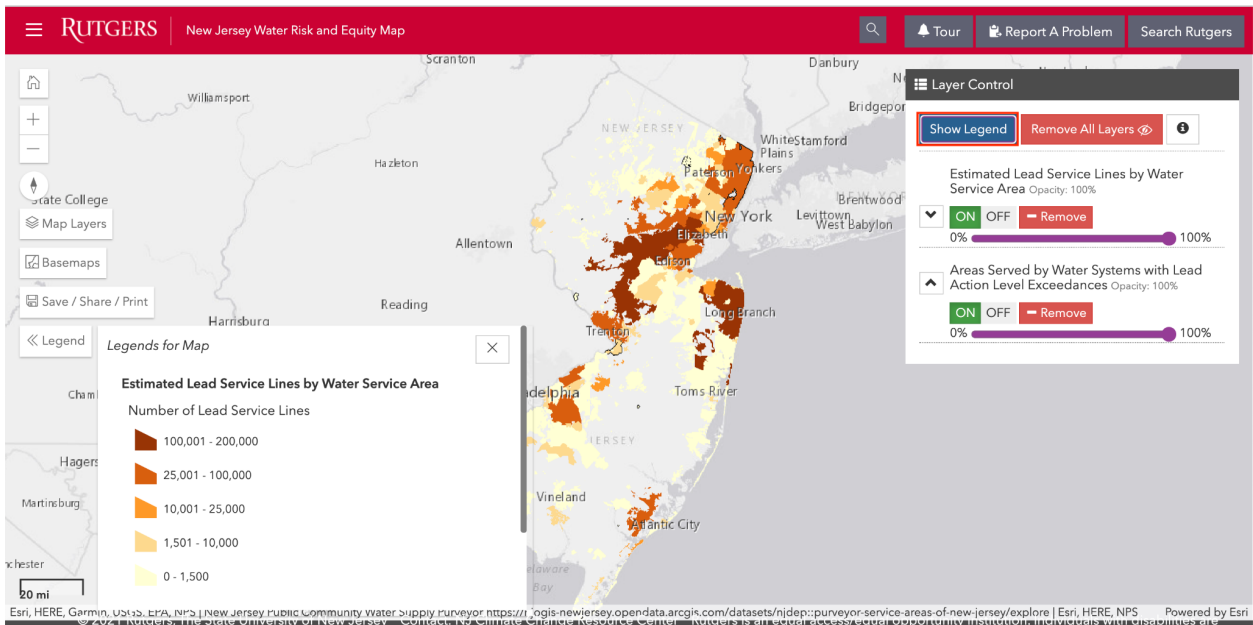


C2. The screenshot above shows that clicking on the relevant polygon reveals a window with information about the polygon.



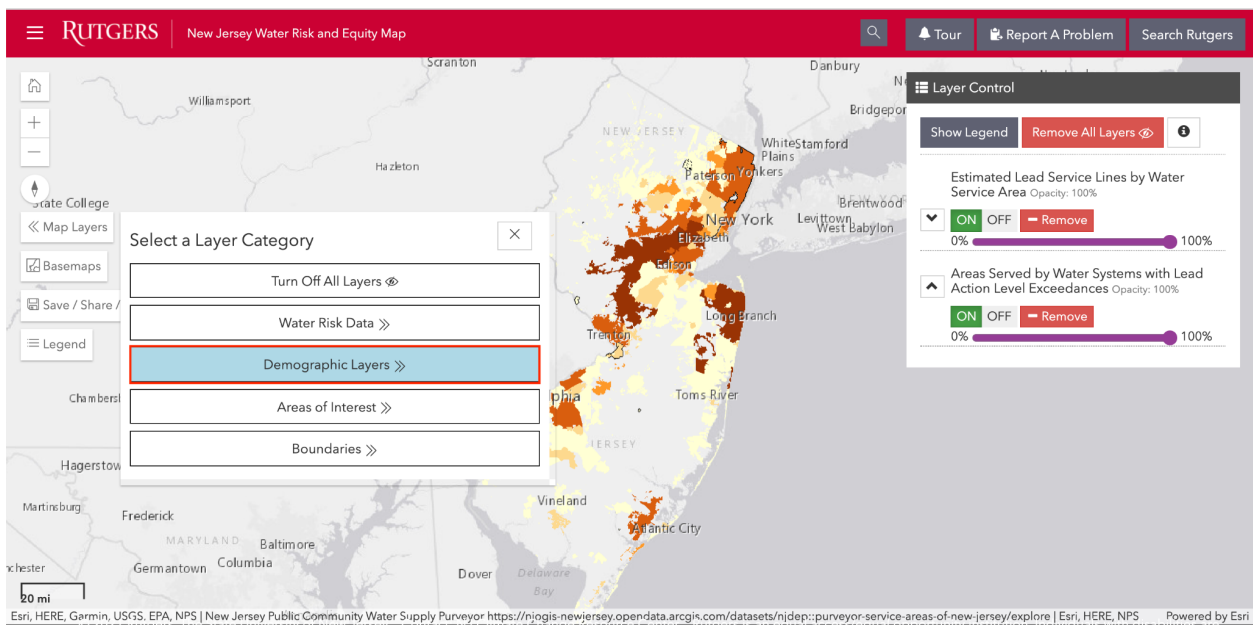
C3. The screenshot above shows that both layers have been added. Whichever layer appears first in the list of layers is the one that will appear foremost on the map. Clicking on the up or down arrow buttons (see: adjacent to the ON/OFF buttons) will change the order of the layers on the map. Additionally, the transparency of the layers can be adjusted via the sliding scale (0% to 100%).

- D) Click the “Show Legend” box within the “Layer Control” window to see the legend pop up in another window. When there are multiple layers selected, you can scroll down within the legend window to see the other layers’ legends.

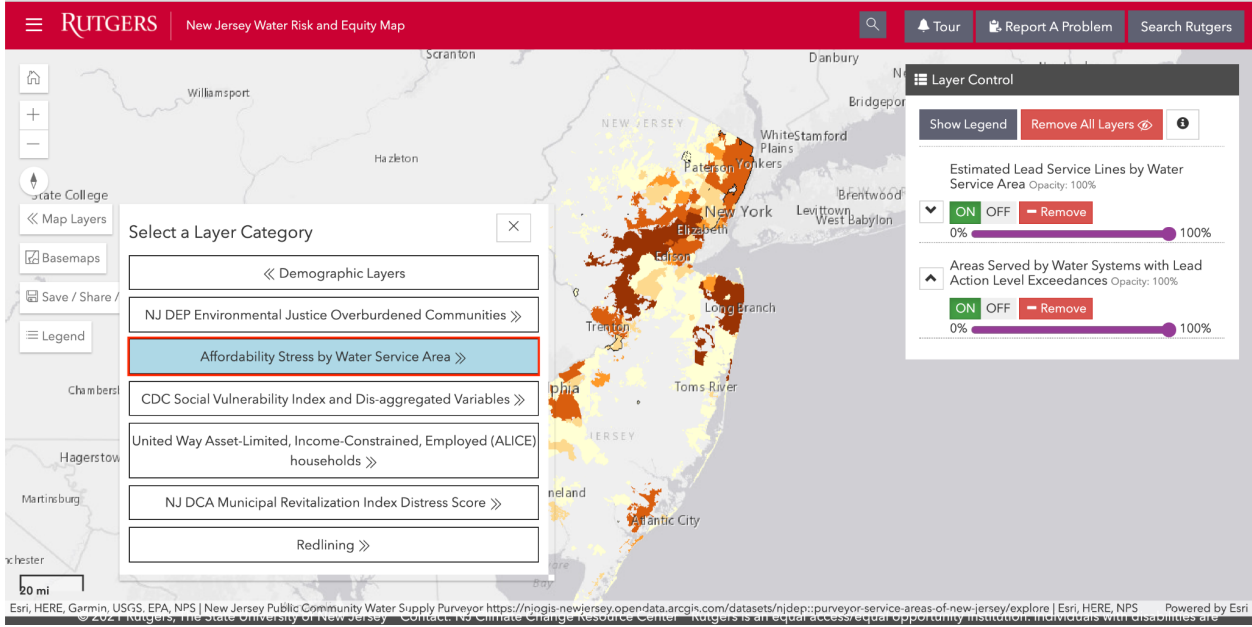


3) To see the relevant demographic layer:

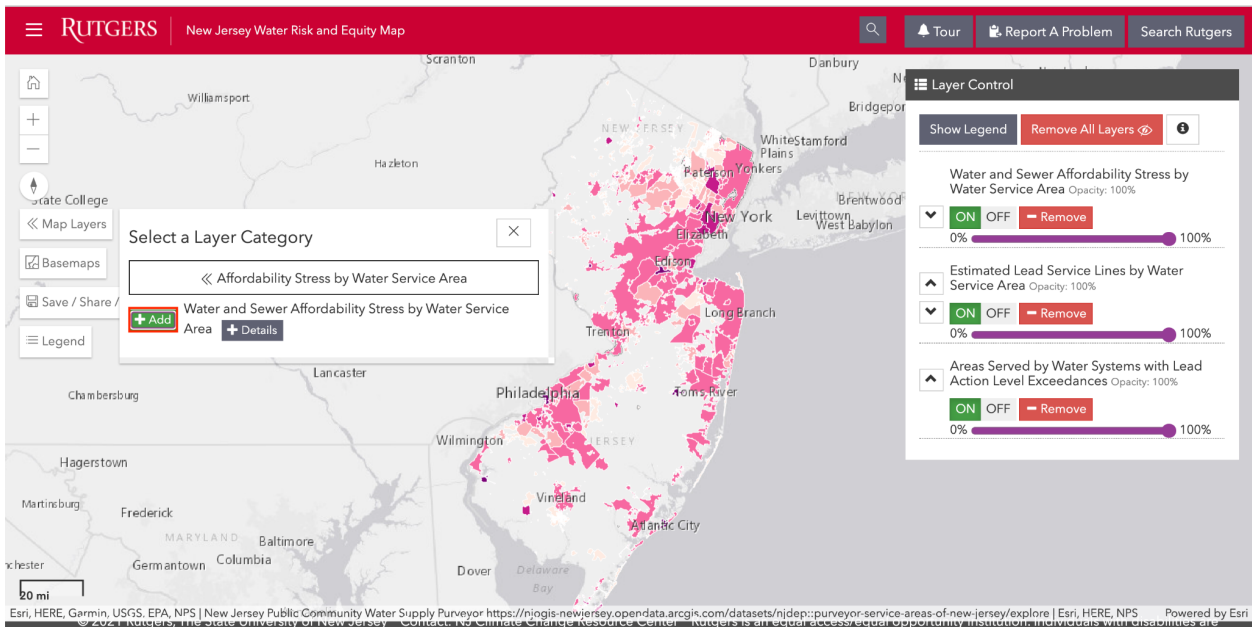
- A) Open the “Map Layers” window again. If needed, click where it says “<< Lead” and then “<< Water Risk Data” to go back to the window where you can “Select a Layer Category.”
- B) Select “Demographic Layers” from the list.



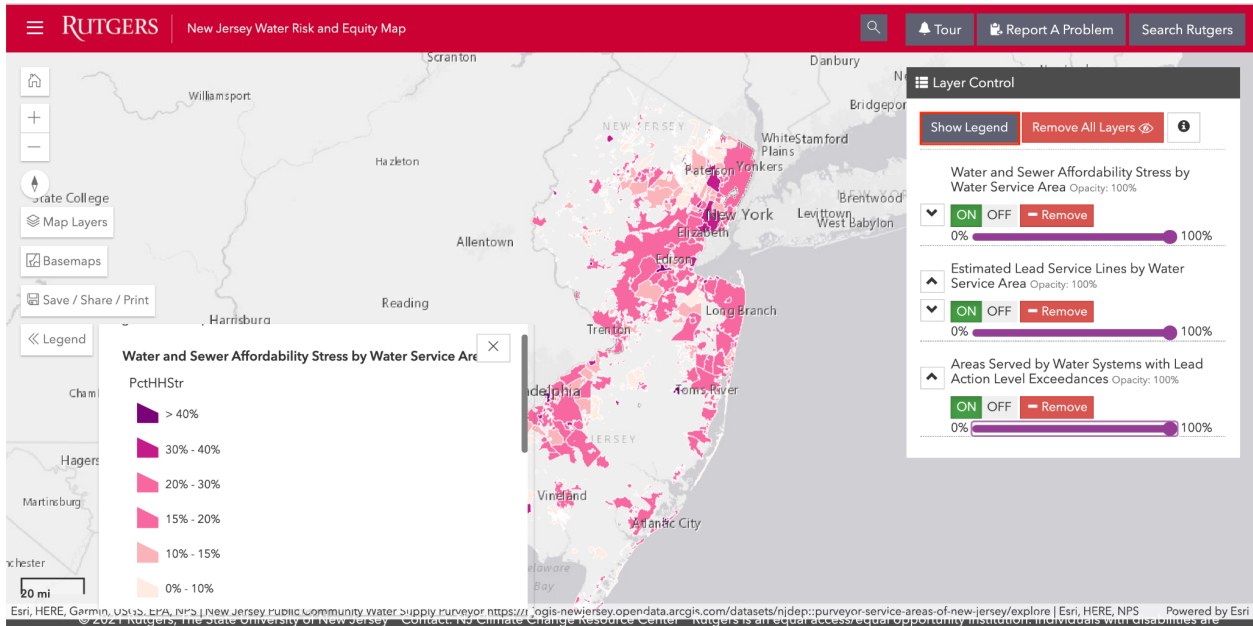
C) Select “Affordability Stress by Water Service Area” from the list.



D) Select the “+ Add” button to add the relevant layer to the map.



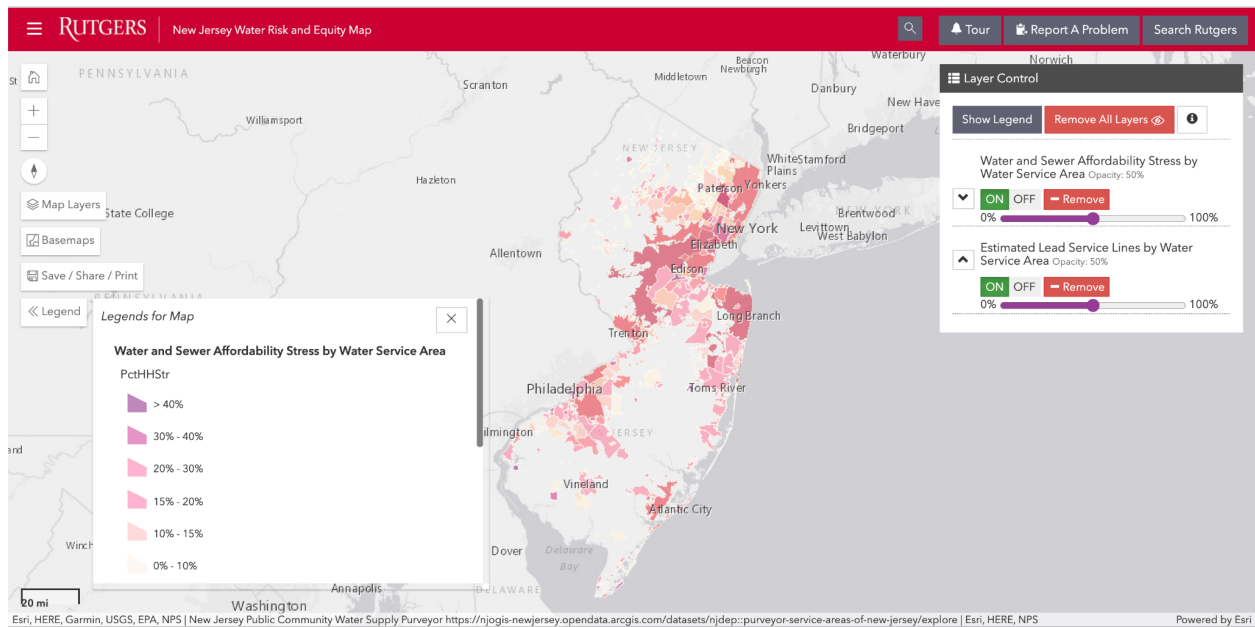
- E) Click the “Show Legend” box within the “Layer Control” window to see the legend pop up in another window. When there are multiple layers selected, you can scroll down within the legend window to see the other layers’ legends.



When all the relevant layers have been added to the map, you can adjust the transparency (again, by clicking/dragging on the sliding scale) to visualize the intersection of all three layers.

Illustrative Examples

The following screenshot shows the geographic footprint across the entire state of New Jersey of the baseline threshold of household affordability stress and the reported number of lead service lines. This information, along with the related tool, Jersey WaterCheck, can then be used to generate lists of those drinking water systems that could be provided with state/federal subsidies for lead service line replacement.



The following screenshot shows a particular service area (Paterson) that has a relatively high number of lead service lines and a high percentage of household utility bill affordability stress, as indicated by the darker color shading Paterson. Note that the transparency of both layers has been reduced to about 50%, so darker shading indicates high values for both layers and vice versa for lighter shading.

Figure X. Zoomed-in view of Paterson. Both layers are on.

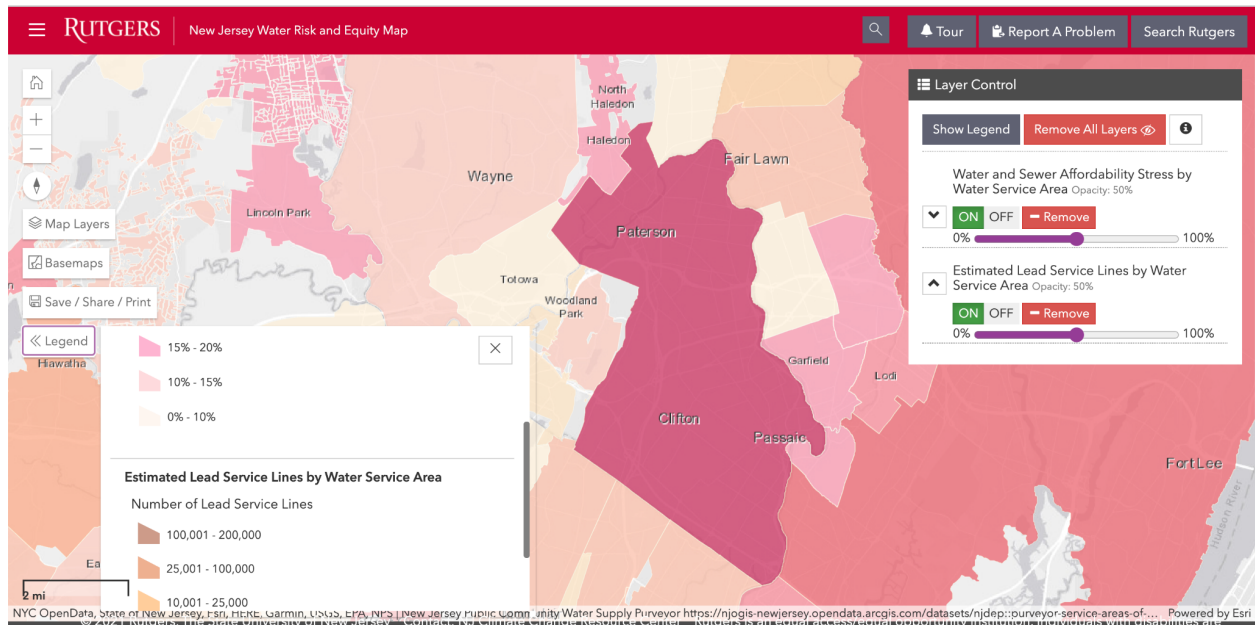


Figure X. Zoomed-in view of Paterson. Only the affordability stress layer is toggled on.

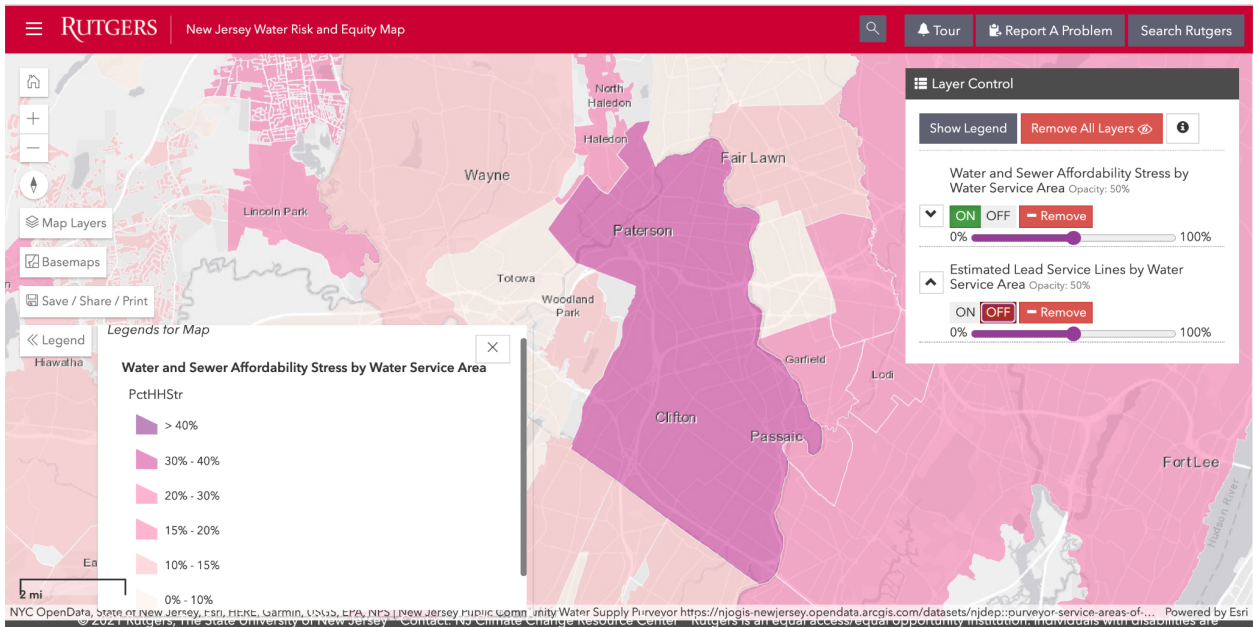
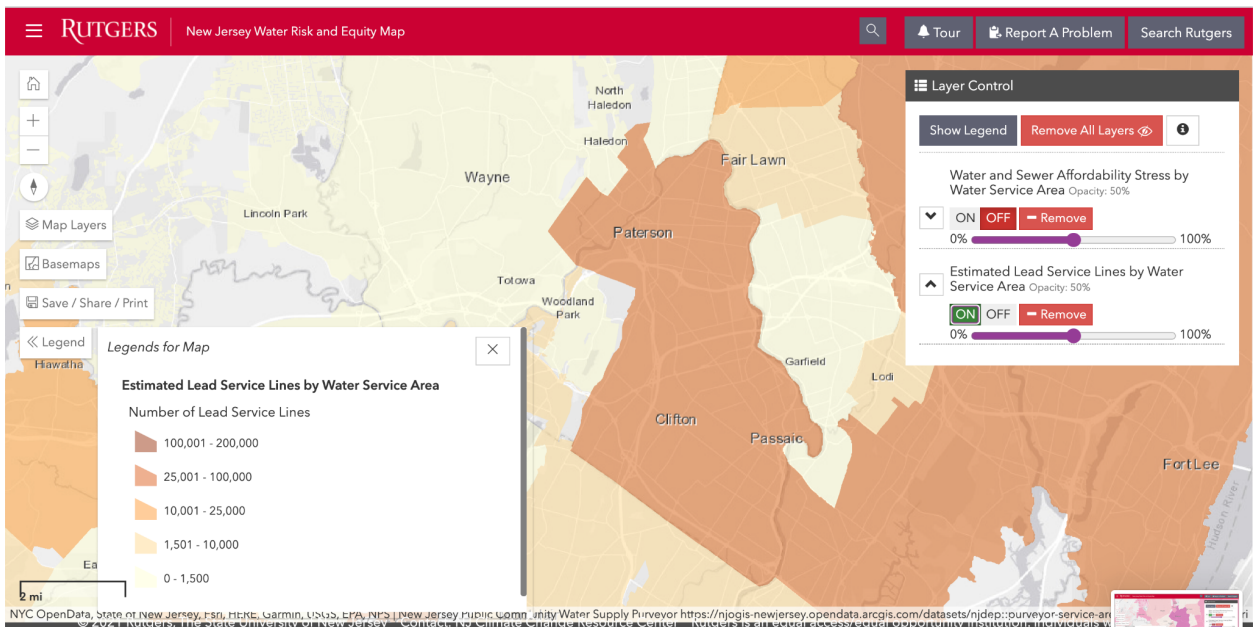


Figure X. Zoomed-in view of Paterson. Only the lead service lines layer is toggled on.



Statewide Data for Individual Water Systems

On Jersey WaterCheck, users have the ability to download data from the Benchmark Hub in an Excel file. Currently, the user can download data for one metric at a time, but it can be easily combined with data from other metrics into a single spreadsheet using the identifying information for the drinking water systems. So, for example, a decision-maker at the state level could download the data for the three metrics for drinking water utilities described previously and then manipulate it to identify the communities with the highest number of lead service lines that have also had a lead action level exceedance and serve a relatively high percentage of households with potential bill affordability stress.

Pictured: A portion of the Excel spreadsheet including the data downloaded for the metric, “Number of drinking water service lines reported to be made of or contain lead, including unknown (system-level).”

| | A | B | C |
|----|--------------------------------------|------|-----------------------------|
| 1 | Utility | Year | Measurement (service lines) |
| 2 | Aberdeen - Cliffwood/Cliffwood Beach | 2020 | 0 |
| 3 | Aberdeen - Freneau | 2020 | 0 |
| 4 | Aberdeen - High School/Oakshade Area | 2020 | 0 |
| 5 | Allendale Water Department - SUEZ | 2020 | 1,757 |
| 6 | Allentown Boro - Drinking Water | 2020 | 0 |
| 7 | Andover Boro Water Department | 2020 | 0 |
| 8 | Aqua NJ - Bear Brook | 2020 | 0 |
| 9 | Aqua NJ - Blackwood | 2020 | 213 |
| 10 | Aqua NJ - Brainards | 2020 | 0 |
| 11 | Aqua NJ - Bunnvale | 2020 | 0 |
| 12 | Aqua NJ - Byram | 2020 | 0 |
| 13 | Aqua NJ - Califon | 2020 | 305 |
| 14 | Aqua NJ - California Village | 2020 | 0 |
| 15 | Aqua NJ - Cliffside Park | 2020 | 0 |
| 16 | Aqua NJ - Eastern Division | 2020 | 2,981 |
| 17 | Aqua NJ - Fox Hill | 2020 | 0 |
| 18 | Aqua NJ - Hamilton Square | 2020 | 7,946 |
| 19 | Aqua NJ - Hanover Mobile Village | 2020 | 0 |
| 20 | Aqua NJ - Harkers Hollow | 2020 | 0 |
| 21 | Aqua NJ - Lawrence | 2020 | 890 |
| 22 | Aqua NJ - Phillipsburg | 2020 | 4,081 |
| 23 | Aqua NJ - Riegel Ridge | 2020 | 120 |
| 24 | Aqua NJ - Riegelsville | 2020 | 0 |
| 25 | Aqua NJ - Seaview Harbor | 2020 | 0 |
| 26 | Aqua NJ - Spartan Village | 2020 | 0 |

Why This Approach is Needed

Tools like the Water Risk and Equity Map and Jersey WaterCheck, especially ones that are easily accessible online and interactive, are important tools to use when analyzing data for decision-making since they make it possible to visualize information on a spatial basis and provide accessible data in an excel format. They also allow interaction from users with different native languages, serving as another form of communication beyond written text, tables, graphics, etc. Resources such as these will support equitable lead service line replacement programs by combining important pieces of information: 1) the number of lead service lines in each drinking water system service area; 2) which drinking water systems have had an Action Level Exceedance for lead; and/or 3) which communities with lead service lines are the most economically disadvantaged, so that decision-makers can identify priority areas.

Potential Impact if Widely Adopted

As stated before, this type of data, available in both a spatial format and in a manipulable spreadsheet format, can help guide state policy decisions on equitable funding for lead service line replacement. Specifically, it can help decision-makers identify communities and water systems that should be prioritized for state subsidy funds. For example:

- State government officials can use tools like the New Jersey Water Risk and Equity Map, Jersey WaterCheck, and the underlying data to identify the locations that should be eligible for the most generous levels of lead service line replacement principal forgiveness (i.e., grants). This will ensure that state assistance programs (e.g., State Revolving Fund, ARP, etc.) are targeted properly.
- Advocates can use these maps and tools to make the case to the state funding programs that the lead service line replacement subsidies can and should be targeted to places with a high percentage of lead service lines and a rate base that will be challenged in paying for replacements.

Such data can also help a drinking water utility decide where to prioritize lead service line replacement work. Almost without exception, all municipalities have pockets of absolute or relative poverty. A map like this can help drinking water utilities identify the geographic areas with the greatest water affordability stress, so they can prioritize them for early lead service line replacement efforts. A child's chance of being protected from lead should not depend on their family's ability to pay.