

Summer 2020

## Building Well

### A NOTE FROM THE PRESIDENT

NEI is not, and cannot afford to be, just an environmental organization. The scourges of racism and environmental degradation share some of the same roots. Our job has always been, and still is, to try to knit these together and do something about it.

As we mature as an organization we have more capability to do this. We have kept up the work, grown a financially stable organization with a deep and committed staff, but we must always strive to do more. Being purposeful about this is essential. This newsletter reflects some of our recent efforts to help our community's resiliency and equity.

— Edward F. Connelly  
NEI President

### A Resilience Masterplan for Public Housing Developments in MA

BY FRANK STONE, PROJECT MANAGER

New Ecology (NEI) recently partnered with Kleinfelder (KLF) to complete the Climate Hazard Adaptation and Resilience Masterplan (CHARM) project for the Massachusetts Department of Housing and Community Development (DHCD). The project goal was to assess and plan for mitigating the risks posed by climate change to the 1,430 Local Housing Authority (LHA) housing developments in Massachusetts funded by DHCD. The project aimed to protect residents from flooding, sea level rise and storm surge, and extreme heat over the next 70 years by creating a toolkit that will respond to LHA's changing planning needs over time.

Over the next 70 years, LHA residents will face longer and hotter heat waves, paired with increased likelihood of flooding and displacement. By the year 2100, Massachusetts can expect to experience up to 64 days per year over 90 degrees Fahrenheit, a 16% increase in rainfall, and between four and ten and a half feet of sea level rise. Risk mitigation strategies implemented now will help protect residents and staff from potentially devastating future events.

Major strategies of the CHARM project included a Risk and Vulnerability Assessment (RVA) for all developments, pilot site assessments of the most exposed properties with immediately implementable strategies to mitigate exposure risks, and tools to track and monitor resilience upgrades to each development in the portfolio.

The NEI/KLF team brought a wealth of experience to the project. The team has completed dozens of resiliency assessments throughout New England, New York, and the Mid-Atlantic, including many for DHCD-funded properties. NEI provided capital planning, design building operations, and project management expertise, while KLF provided mapping, planning, design, and graphic design expertise. Architects and engineers from both teams collaborated to provide optimal technical leadership.

The DHCD now has a set of resources designed to anticipate potential risks to residents, a plan to mitigate and reduce those risks, and the ability to continuously track and report on improvements to properties. Measures include:

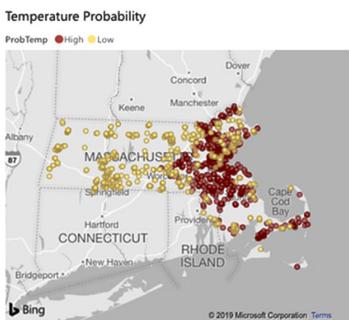
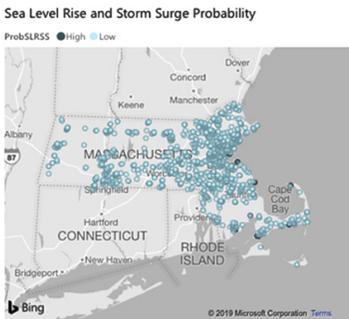
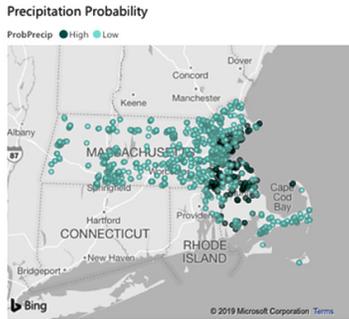
#### Risk and Vulnerability Assessment (RVA) Database and Map

NEI/KLF have provided the DHCD with a fully updateable RVA database and map to keep track of risks to developments as conditions evolve. As new data are input into the database over time, DHCD can continue to update the list of housing complexes that are most at risk.

**CHARM**  
CLIMATE HAZARD ADAPTATION & RESILIENCE MASTERPLAN



*continued on next page*



The locations of developments and their corresponding exposure to the three main hazard categories assessed—sea level rise/storm surge, precipitation, and extreme heat.

### Rapid RVA

NEI/KLF also provided the DCHD with a rapid RVA tool: a list of 25 questions that results in a resilience score that allows LHAs and contractors to assess risk at a given development and integrate solutions into the capital planning process. The rapid RVA questions address typical features of MA buildings, and serve as guidelines for resiliency best practices. The rapid RVA will also be integrated into the 5-year capital planning review for each LHA development, allowing DHCD to have an “at-a-glance” look at preparedness across the portfolio.

### Recommendations for Future Improvements

The project’s multidisciplinary experts provided a working list of recommendations to mitigate the risks to the most exposed developments as captured in an extensive set of resilience edits to the DHCD design guidelines. These guideline recommendations are provided for consideration by LHAs as updates and renovations are made. Measures include incorporating community cooling rooms, cool roofs and pavements, increasing insulation, and elevating mechanical and electrical systems.

The tools and information provided in the CHARM project are already being put into action. DHCD has begun training project teams on the CHARM tools, and will soon post the resources publicly. The Rapid RVA tool will be integrated into the capital planning process to track improving resilience scores and the constantly changing environmental conditions. As new data sets like the updated Massachusetts Coastal Flood Risk Model come online, project maps and risk evaluations will continue to be updated. The DHCD now has the tools and knowledge to update their strategies to protect residents as conditions evolve.

## Adjusting Sustainability Strategies from the Northeast to the Mid-Atlantic

BY PAT COLEMAN, DELAWARE REGIONAL MANAGER

New Ecology has expanded throughout the Mid-Atlantic, opening offices in Baltimore, MD and Wilmington, DE. When working in the Mid-Atlantic, we’ve adapted our green building and energy efficiency services to the unique regional characteristics, needs, and opportunities to advance our mission in a new way.

Rowhouses are a dominant building type in the Mid-Atlantic: the low-rise, attached, largely single-family homes that in other regions might be called brownstones or townhouses. In the Philadelphia metro area, 62% of the housing stock - more than 400,000 units - are rowhouses. Nationally, the rate is 9%. As a comparison, the Boston area’s ubiquitous triple-deckers are roughly 30% of the region’s housing stock.

Other Mid-Atlantic distinctions, relative to the Boston area, are the lower property values and housing costs. While not as a deeply affordable as public housing or a Section 8 property, the housing in many areas of the Mid-Atlantic are within reach of lower- and moderate-income households. Our friends at [Elevate Energy](#) estimate that about 80% of rowhouse units in Philadelphia, Wilmington, and Baltimore are affordable to families earning 80% of their respective AMIs. But this trend is changing: a recent [study](#) of Philadelphia shows median home sale prices increasing and a slowdown in the number of mortgage-backed sales among lower-priced homes.



Vacant rowhouses in Wilmington, DE.

*continued on next page*

Another unique factor in the Mid-Atlantic is the volume of vacant properties. In Philadelphia, there are an estimated 42,000 vacant properties which the city is pushing into a quasi-public land bank that primes properties for a return to productive use. The City of Wilmington created a land bank with a similar objective, and through which one may purchase a rowhouse for roughly \$3,000.



Rowhouses in Baltimore, MD.

In this environment, community-based and other organizations have launched neighborhood revitalization efforts to stabilize neighborhoods by mitigating blight and providing affordable housing through housing rehabilitation and workforce development initiatives. Missing, however, are robust programs and resources with an emphasis on energy efficiency, building performance, and training for a green workforce. The rehabilitation of these properties, many of which are gut rehabs that require significant work on the building envelope and new HVAC systems, offers a generational opportunity for investment that will deliver decades of benefits, including reduced utility bills and carbon emissions, enhanced resident comfort, and improved indoor air quality.

New Ecology's overarching question is: how can we systematically convert the existing bulk of housing and embodied

carbon into all-electric high-performance homes with a financing and stewardship plan that provides future occupants with healthy housing and the opportunity to build equity for generations to come?

We are pleased to have built relationships with a number of local partners - developers, CDCs, CDFIs, advocacy groups, and others - interested to take on these challenges and create a new future for rowhouses and similar small-scale properties throughout the Mid-Atlantic.

## WE ARE HIRING!

*New Ecology is looking to expand our team. We have several open positions, and we are successfully working to on-board and train new hires remotely. Check out [newecology.org/category/jobs](https://www.newecology.org/category/jobs) to see our job postings and instructions on how to apply.*



## WHAT'S COMING UP?

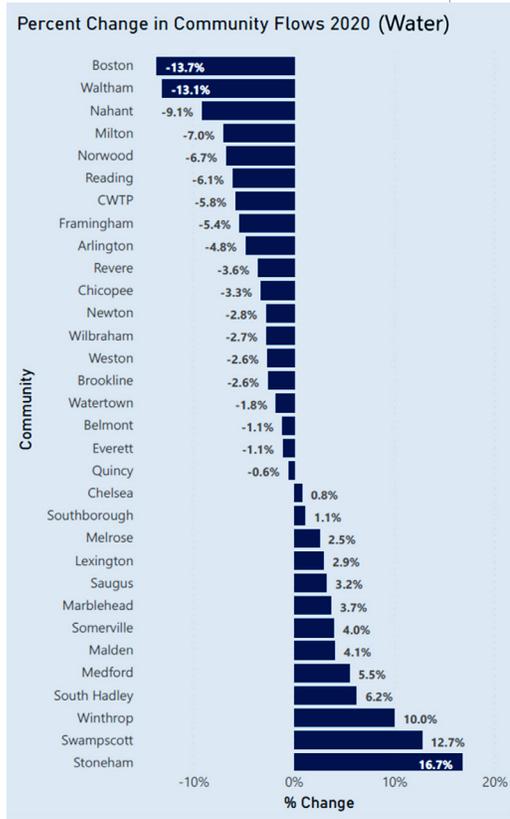
We're excited to be a part of Exelon Foundation & Exelon's Climate Change Investment Initiative. Innovative solutions are needed to address climate change, and we are honored to be chosen to help address climate change mitigation & build resiliency to health and environmental issues in the most under-resourced communities in Exelon's service area.

Learn more about this effort to mitigate climate change in the [press release](#).

# Water Use During the Pandemic

BY JESSICA DARLING, DATA SCIENTIST

As COVID-19 caused many of us to work from home starting Spring of 2020, there has been a shift in the way we use utilities. We are cleaning more than ever before and singing happy birthday twice when we wash our hands. How has this affected our water usage? As commercial buildings closed to the public, the burden has shifted to residences. The Massachusetts Water Resource Authority reported a varying level of change across cities and towns throughout Massachusetts. Regional use declined in cities like Boston and Newton, which house large commercial districts and colleges. More residential areas, such as Swampscott and Stoneham, have seen an increase in water use.



Source - MWRA

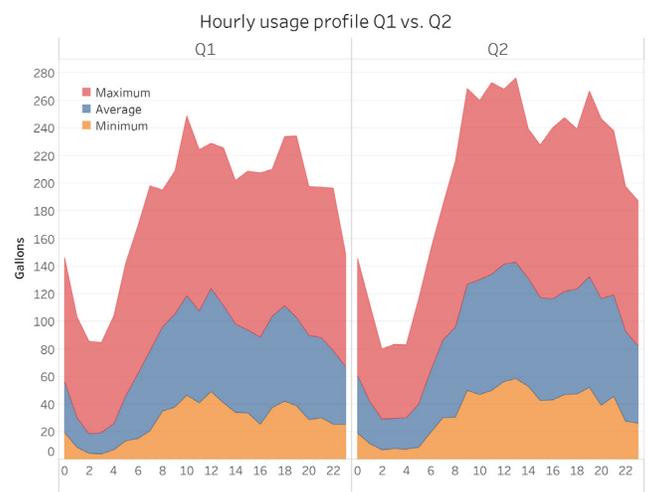
## Impact in Multifamily Affordable Housing

Pandemic water use has changed in two ways - the total consumption of water has increased, and the time of day when water is used has shifted. Typical water-use patterns from before the pandemic showed two peaks - one in the morning before typical working hours, and a second when people are returning home from work and school. This type of usage pattern is called the "duck curve".

The graph shows the change in water use patterns for a typical multifamily building in Boston, MA from January - March 2020 and April - June 2020 (the approximate time period when people began staying home).

Overall, usage has increased by 18% at this building. Additionally, the time of day when most usage occurs has shifted - people are waking up later, presumably due to a lack of commuting. The maximum hour of usage is 8% higher in Q2 compared to Q1.

This increase in water use has implications on affordable housing. As affordable housing seeks to maintain affordability by keeping energy and water costs down, this increase in operating costs that are borne by the building owners and operators could have implications on the resiliency of the housing. In the future, these increases in operating costs could be passed on to tenants through rent increases.



## WHO WE ARE

Founded in 1999, New Ecology, Inc. (NEI), is an innovative, mission-driven non-profit. We are nationally known for our community-focused work advancing sustainable practices, reducing fossil fuel use, creating clean energy, eliminating pollution, promoting resiliency and enduring healthy environments in which to live, work, and thrive.

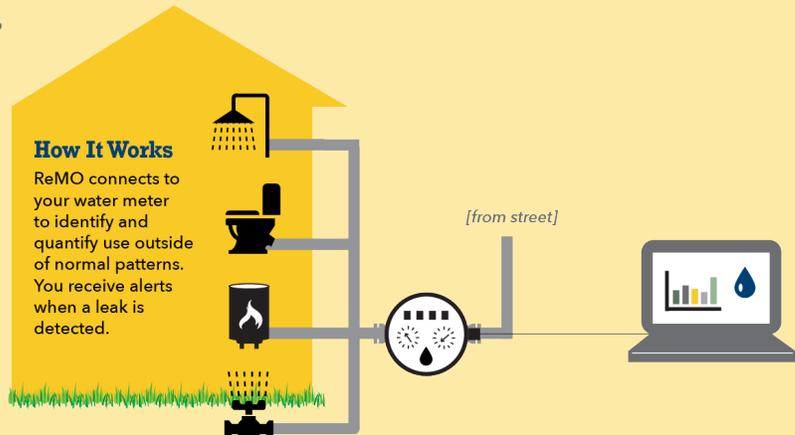
Now is the time for buildings to look at their water consumption and ways to track their usage. If your building's occupancy patterns changed over the last few months, does your water usage line up with the changes you have seen? Are you still seeing continuous high usage in unoccupied spaces or at unusual times? If spikes or high water bills are a concern for you, you may want to look deeper into your building's water use.

## STOP LEAKS. SAVE MONEY.

New Ecology has developed a way to detect leaks faster and save money with minute-by-minute tracking. We call it **ReMO: Remote Monitoring and Optimization**.

*Real-time water monitoring is the key to detecting and quantifying leaks quickly.* Water meter monitoring with ReMO can cost as little as \$2 per day per building.

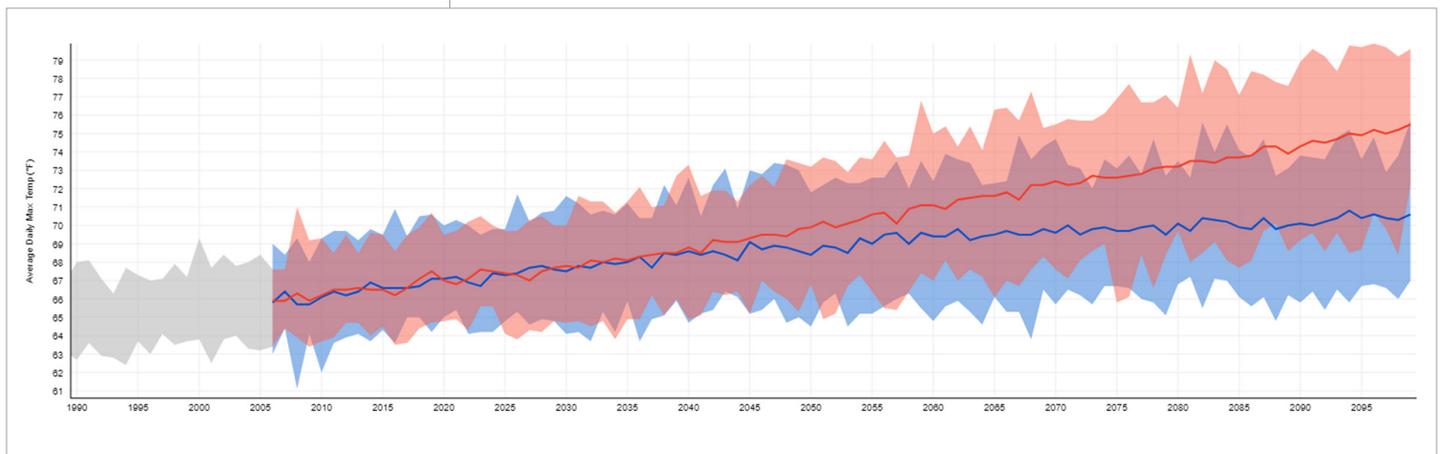
Interested in learning more?  
Visit [newecology.org/remo-wm](http://newecology.org/remo-wm)



## Use of Weather Data in Evaluating Buildings

BY JUSTIN IOVENITTI, ENERGY ENGINEER

The use of climatological data is critical to understanding how to design, build and operate buildings. In order to maintain indoor environmental conditions within a safe and comfortable range, one must understand the impacts that the local climate will have



Graphical representation of a range of global climate results for two possible futures of high and low emissions ([source](#)).

on the built environment. The ASHRAE climatic design conditions in the **Fundamentals handbook** is perhaps the most common source of such data for designers in the United States. In addition to conventional metrics such as dry bulb temperature and wind speed, ASHRAE lists dozens of other data points to consider, including precipitation, wet bulb temperatures, daily temperature range, and solar radiation.

*continued on next page*

## NEW ECOLOGY PROJECTS IN THE NEWS

New Ecology was mentioned in the Better Buildings Challenge Solution Center on portfolio-wide resilience assessments on the properties of Jonathan Rose Companies.

<https://betterbuildingsolutioncenter.energy.gov/implementation-models/jonathan-rose-companies-implementing-portfolio-wide-resilience-assessments>

New Ecology was mentioned in this article on the rejuvenation of the Harvey, a sustainable development project in Charlestown, MA which New Ecology is working on with CBT. The Harvey is expected to achieve LEED Platinum certification this year.

<https://gbdmagazine.com/2020/green-housing-in-boston/>

New Ecology's role in the Exelon Foundation and Exelon Corporation's \$20 million Climate Change Investment Initiative and its impact in the Wilmington, DE area was mentioned in this article:

<https://technical.ly/delaware/2020/07/16/exelon-20-million-climate-change-investment-initiative-impact-wilmington-second-chances-farm-new-ecology/>

**NEWSLETTER CONTRIBUTORS:**  
MICHELLE MORAN, JESSICA DARLING,  
JUSTIN IOVENITTI, FRANK STONE,  
REBECCA ANSOLABEHRE, BARBARA  
MARTINS, LAUREN BEACH, PAT  
COLEMAN, ASHLEY WISSE, TOM  
CHASE, JOSHUA GALLOWAY,  
ED CONNELLY.

The most recent design conditions compiled by ASHRAE typically cover a 25 year period from 1990 to 2014. This is difficult to reconcile with a rapidly changing climate. The science is clear that human impacts have already set the globe on a precarious path. Carbon and other emissions (past and continuing) have led to **global warming of 0.2°C per decade** according to the Intergovernmental Panel on Climate Change (IPCC). Global warming and sea level rise are not theoretical - they are reality. Their impacts are profound. This summer alone, news sources have reported on rapidly shrinking ice sheets, frequent tidal flooding, and extraordinarily warm sea surface temperatures. In fact, in each of the past six years **named storms have formed in the Atlantic Ocean** prior to the recognized start of the hurricane season (June 1 to November 30).

Is it prudent or responsible to rely on decades old data to design modern day building enclosures or heating and cooling equipment? Researchers have considered similar questions, and in some cases concluded that long-term historical observations "**not only have little relevance to the future climate, but are often unrepresentative of the current climate.**"

At New Ecology we have been grappling with these issues and their impacts on our projects. For ASHRAE level II energy audits it is common practice to weather normalize historical energy consumption using typical meteorological (TMY) data sets. There are obvious flaws to this approach that have led us to consider alternatives. We analyzed the three most recent winters on one property in southern Delaware, and found that on average they were 24% warmer (by heating degree days). This prompted our engineers to compile a 15-year average of historical weather data from a nearby station, rather than rely on the more distant (and much colder) TMY site data to prevent skewed results. Meanwhile, the very highly insulated enclosures of Passive House buildings can create additional loads for cooling systems since the structures are so adept at retaining heat. As the **trend of warmer summer nights** continues, buildings which overheat in the cooling season become a real concern. In response our green building staff have "tested" current designs against climate projections such as those from the IPCC to forecast how buildings will perform decades in the future.

New Ecology continues to refine our approach to future-proofing building systems. We recognize how crucial the decisions we make today will impact the built environment of tomorrow. This becomes imperative in our work to build more resilient communities, especially since the most vulnerable members of society are likely to be impacted first.



### BACK IN THE FIELD

*The New Ecology HERS team has taken the lead in our new field work protocol, including (but not limited to) extensive PPE donning and doffing procedures. Here's a shot of a few of our employees in action!*



Ashley and her rescue dog, Layla

## LET'S TALK

New Ecology is eager to work with partners who are interested in learning more about our work and how we can help you to achieve your project's goals. We have worked on hundreds of projects for owners in market sectors including housing, office, retail, education, healthcare, government, arts, and nonprofit.

Our passion and commitment is best demonstrated by the fact that we have been at the leading edge of community-based sustainable development since 1999.

At the same time, our reach, approach and successful model have helped us attract and retain a talented staff known for its desire to make advances in a new and growing field.

Interested in learning more? Contact [info@newecology.org](mailto:info@newecology.org) or call 617-557-1700.

## NEW ECOLOGY

Community-Based Sustainable Development

BOSTON | BALTIMORE  
| WILMINGTON

15 Court Square, Suite 420  
Boston, MA 02108  
[www.newecology.org](http://www.newecology.org)  
617-557-1700

## Staff Profile

**Name:** Ashley Wisse  
**Title:** Senior Project Manager

**What does your job entail?** I am known as the "LEED expert" around the office and most of my project work is focused on coordinating rating system certifications. I have guided hundreds of LEED, Enterprise Green Communities, and Energy Star certifications, and I am now diving into the world of Passive House and Net Zero.

**What is the most inspiring/interesting part of your job?** I love to read, learn, and research - keeping up with cutting edge technology and equipment is a key part of our industry and I am so thankful that New Ecology fosters a culture of education, research, and sharing of ideas among the staff.

**What is a challenge people in this industry face that you would like to solve?** I would love to increase reduction, reuse, and recycling of building materials, pushing towards zero waste. The majority of materials packaging is non-recyclable and often damaged, or demolished, equipment and materials are not reused. Reduction of the waste generation can have significant long-term impact on carbon and other greenhouse gases. My first stop for every home renovation project is my local Re-Use store!



Ashley and Layla paddle boarding

### What do you like to do outside of work?

I love to renovate my home, spend time in my garden, and train for endurance races in running, biking, swimming, and canoeing. I also have a rescue dog who demands a daily walk and frisbee session!

### Favorite movie/TV show/Band?

TV Show: Sherlock. The cinematography and directing is amazing, and episodes/seasons were limit-

ed enough that you always want more. It is definitely not a show that you can watch while scrolling Instagram! On the flip side, I love all sitcoms for a fun break and good laugh! Music: I am an 80s baby and all my favorite playlists are 80's mixes!

**What are you doing to keep happy and healthy in quarantine?** Most of my long-term goals and international travel plans have been changed or delayed, so I am focusing on more short-term goals. Right now, I am working on starting my day with 5-10 minutes of yoga. My body does not enjoy working out in the early mornings (sans adrenaline of race day), but I want to get more exercise done before work—a quick yoga session helps wake everything up.

### What is advice you would give to somebody looking to start in this industry?

Assess your reasoning for joining the industry—what is the main thing that drives you? Net Zero Energy? Materials Reuse? Greenhouse Gas Reduction? Then, learn as much as you can about that focus. Become the expert that co-workers and colleagues come to with questions. There are so many facets to this industry and "the best option" changes daily, so it can quickly become overwhelming to know everything about everything. Having a reminder of your passion and focus helps ground conversations and objectives.