

FALL 2024

# THE RAPPAHANNOCK REPORT

*The Rappahannock Group Sierra Club Newsletter*



## OVERVIEW

Pages 1-2:

*Outings Recap*

Page 3:

*Data Center Q&A*

Pages 4-8:

*Urban Heat Islands*

Pages 9-13:

*Chasing Arrows & Chasing Habits*

Page 14:

*Nuclear News*

Page 15:

*Final Thoughts*

## OUTINGS RECAP

*by Geoff Johnson*

The Rappahannock Group Sierra Club (RGSC) held two Outings this past September that supported the environment in several ways. Our first Outing was held at Caledon State Park in King George County, VA. This is one of our annual stops to help cleanup the Potomac River shoreline. Lucia Craven, VA Department of Conservation and Recreation, was our host and lead our wagon ride through the park down to the river shoreline. After two hours of cleanup, we rode back to the visitors center at noon. A majority of the group joined us for lunch at Don Eladio's Mexican Restaurant.



## OUTINGS RECAP

Our second Outing was very popular with seventeen people joining us at the TFC Recycling Plant in Chester, VA. This included members from RGSC and Falls of the James Group in Richmond. Kathy Russel, TFC Recycling, was our host. The tour included an hour of presentation with questions/answers and an hour tour of the recycling plant. This was extremely informative on the capabilities and limitations of recycling in VA. Afterwards we had lunch at Don Pepe Mexican.



With the weather getting cooler our next Outings will include outdoor hikes in local parks and battlefields. As always, these Outings are free and open to the public. If you would like to be on the email list for future RGSC Outings, please email Geoff Johnson [geoffwithrgsc@gmail.com](mailto:geoffwithrgsc@gmail.com)

## DATA CENTER Q&A RECAP

*by Victoria Gallaway*

The Rappahannock Group Sierra Club hosted a town hall on data centers where the public got to hear from a panel of environmental advocates, local elected officials, and data center representatives. This is the RGSC's third event on the issue. Panelists Tim Cywinski, of the Sierra Club, and Julie Bolthouse, of the Piedmont Environmental Council, expressed concerns about the environmental impacts that data centers will pose to the region. Panelist Monica Gary, a Stafford County Board of Supervisors, spoke to the county-side of this issue. Finally, panelists Martin Rapos, a Flexnode employee, and Daren Shumate, the former CEO of Shumate Engineering, spoke about their time working in the data center industry.

Inform Fredericksburg, a local group that calls for greater transparency from local governments, spoke about how they feel that the public has not been properly informed about the numerous data centers that are slated to come to the Greater Fredericksburg Area in the coming years. There were numerous data center representatives who were invited but did not attend, which reflected the difficulty in acquiring information.

During the Q&A portion of the event, citizens wanted to hear about a wide variety of environmental issues, such as electricity and water consumption and the health effects of diesel generators. Some spoke to how they had lived in these rural counties for years, and expressed concern over the changing landscape.

The event was well attended, with roughly 70 people attending in person, and over 2,000 on the livestream. Thank you to everyone who attended both online and virtually!

# URBAN HEAT ISLANDS: A GROWING CONCERN

by Nathan Ferm and Linda Muller

Fall weather brings a most enjoyable respite from the recent grueling summer heat waves. During the sweltering summer of 2024, keen observers of paved parking lots noticed that the choice spots to park were situated under the shade of foliage (trees, tall shrubs). Why? For the simple reason that the trees and other foliage provides shade from intense heat from the sun and reduces the heat inside the car. As temperatures rise and summers grow more intense, residents of Fredericksburg, VA are feeling the effects of the urban heat island (UHI) phenomenon. Urban heat islands occur when areas with large amounts of concrete, asphalt, and buildings retain more heat than their rural surroundings, creating significantly warmer environments. This issue is particularly noticeable in densely developed areas, like downtown Fredericksburg, where heat is absorbed by roads and buildings, then slowly released into the night.



Fredericksburg's combination of historical downtown structures and suburban sprawl makes it particularly susceptible to the UHI effect. Dark surfaces, like asphalt streets and rooftops, can heat up by as much as 50°F above the air temperature, re-emitting that heat into the atmosphere. This extra heat causes temperatures in the city to be higher than in the surrounding rural areas, sometimes by as much as 3°C.

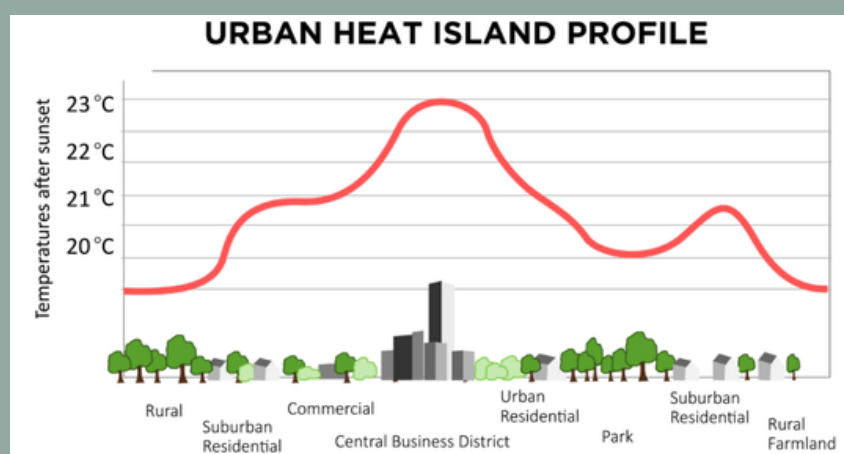


## URBAN HEAT ISLANDS: CONSEQUENCES

The consequences of urban heat islands extend far beyond discomfort. As temperatures rise, urban heat islands are expected to become more extensive as cities contain more heat-absorbing asphalt and less cooling tree canopy.

There are a multitude of consequential impacts from urban heat islands:

- Severe heat related illnesses. This is especially true among vulnerable elderly, children, those with pre-existing health conditions, and outdoor workers.
- Warm stormwater runoff from heated surfaces can pollute nearby rivers and streams, threatening aquatic ecosystems and diminishing water quality. Species in these waters are highly sensitive to temperature changes, and even slight increases can disrupt their reproductive cycles, cause them stress, and even be fatal.
- Greenhouse gas emissions increase. This is due to additional demand for air conditioning which requires more energy, most often generated by fossil fuel powered utilities.
- The lack of shade in many low-income neighborhoods, combined with the abundance of heat-absorbing surfaces means that these areas are disproportionately impacted.
- The elevated temperatures make outdoor activities less appealing, lowering foot traffic to local businesses and diminishing the quality of life for residents.



## URBAN HEAT ISLANDS: START PLANNING NOW!

The question remains, if we know and understand the consequences of urban heat islands, which can have a direct impact on health and well being of citizens and the environment, what can be done to reduce or even eliminate urban heat islands? Planners and communities need to give serious consideration to green infrastructure in their local comprehensive plans, long before another sweltering summer.

The George Washington Regional Commission ([GWRC](#)) along with Friends of the Rappahannock ([FOR](#)) held a joint green infrastructure charette in Spring 2024, which included mapped research results of regional heat islands in Stafford, Spotsylvania, King George Counties, and the city of Fredericksburg. By implementing green infrastructure concepts into general planning, it can help reduce the impacts of urban heat islands.

What are some green infrastructure components? The GWRC offered a listing of some green infrastructure practices- some already undertaken by local organizations like FOR and [Tree Fredericksburg](#)!



## URBAN HEAT ISLANDS: START PLANNING NOW!

Here are some examples of green infrastructure applications:

**Trees and Vegetation** - One of the most effective strategies is increasing the tree canopy. Trees provide natural shade, cooling the air through evaporation and reducing the amount of heat absorbed by paved surfaces. Organizations like Friends of the Rappahannock and Tree Fredericksburg have already made great strides in this area, planting thousands of trees throughout the region to help lower urban temperatures. Trees and vegetation can also reduce stormwater runoff and protect against erosion.

**Green Roofs** - Growing a vegetative layer (plants, shrubs, grasses, and/or trees) on a rooftop reduces temperatures of the roof surface and the surrounding air, helping buildings stay cooler and reducing the need for energy hungry air conditioning. Also called “rooftop gardens” or “eco-roofs,” green roofs achieve these benefits by providing shade and removing heat from the air through evapotranspiration.

**Cool Roofs** - Installing a cool roof – one made of materials or coatings that significantly reflect sunlight and heat away from a building – reduces roof temperatures, increases the comfort of occupants, and lowers energy demand.

**Permeable Pavements** - Using paving materials that allow collected water to be absorbed through the ground in parking lots, driveways and roadways reduces the number of impervious surfaces, such as asphalt parking lots, in favor of more permeable materials like porous pavement. This can further alleviate the UHI effect by allowing rainwater to soak into the ground, cooling the surface.

## URBAN HEAT ISLANDS: START PLANNING NOW!

Of course, the best laid plans may prove difficult to implement due to local or state laws or restrictive ordinances. For example, in Virginia, only Planning District 8 (northern Virginia) has the authority to conserve mature tree canopy during construction. Residents in and around the Fredericksburg region have witnessed large swaths of land stripped bare of all vegetation and left exposed to the elements while construction plans move slowly forward at the site. It may take legislative action to assist with some solutions.

State Action: [Our Common Agenda: Virginia Conservation Network](#)

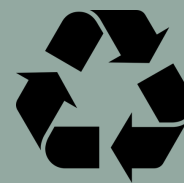
The Virginia Conservation Network, of which Sierra Club is a member, has published its 2025 Environmental Briefing Book in preparation for the upcoming 2025 Virginia General Assembly Session. Included in the briefing book is "Maximizing Tree Canopy" with a detailed explanation of why legislation is needed to protect the tree canopy. All concerned citizens should make plans to visit with Virginia lawmakers during the upcoming 2025 general assembly session. The Rappahannock Group Sierra Club will send out emails and post on the Facebook page of upcoming General Assembly info sessions.

And for those green infrastructure practices that can and should be implemented at the local level... NOW is the best time to plan.

Everyone can play a part in helping to reduce the urban heat island effect in Fredericksburg. Planting trees in your yard or neighborhood, participating in local tree-planting events, and encouraging the use of green roofs and reflective materials in new developments are just a few ways to make a difference. You can also support local environmental organizations working to raise awareness and implement solutions, like Friends of the Rappahannock and Tree Fredericksburg.



# THE CHASING ARROWS & CHASING HABITS



by Paula Chow

Fossil fuels fuel the plastics industry. Our demand for any version of plastic continues unabated. Open your kitchen drawers and cabinets and a majority of people will have plastic items which they use everyday, some of which is unnecessary plastic.

The plastics industry figured out a very clever mechanism to continue manufacturing plastic - the chasing arrows. The triangular chasing arrows logo was first created by a college student for the first Earth Day celebration in 1970. According to the Environmental Protection Agency (EPA), this logo is deceptive and misleading. Since 2023, the Biden administration has been considering whether this symbol is misleading to the public and could eliminate it. (1)

At issue is the resin number of different types of plastics. Resin 1 and 2 plastics, such as bottles and jugs, are the most easily recycled products. But those marked with numbers 3-7 categories that include plastic bags, styrofoam, and plastic trays are typically not recycled and are instead sent to landfills or burned. (1)

The placement of the chasing arrows symbol upon these hard-to-recycle single-use plastics "does not accurately represent recyclability as many plastics (especially 3-7) do not have end markets and are not financially viable to recycle," the EPA said in its comments. (1)

In an effort to slash global plastic pollution by 80% by 2040, the United Nations' May 2023 report says that excessive packaging and single-use plastics need to be eliminated from use.

American households produce about 51 million tons of plastic waste a year. Only 5 percent of it is recycled.

# THE CHASING ARROWS & CHASING HABITS

## Local issues

For these chasing arrows within Rappahannock Group's region:

Fredericksburg and Stafford County do not accept plastic #3-7 for recycling as there is no end market for them. The counties of King George, Spotsylvania and Caroline accept all household plastic while Culpeper County accepts #1-5.

The question naturally follows, "If there is no end market for plastics #3-7, what happens to these mixed plastics that are collected as recycling?"

## The difference between biodegradable and compostable

The word biodegradable is distinct in meaning from compostable. Biodegradable simply means an object is capable of being decomposed by bacteria or other living organisms which can take years or decades to break down. "Compostable" in the plastic industry is defined as able to decompose in aerobic environments that are maintained under specific controlled temperature and humidity conditions.

Compostable means capable of undergoing biological decomposition in a compost site such that the material is not visibly distinguishable and breaks down into carbon dioxide, water, inorganic compounds and biomass at a rate consistent with known compostable materials.

There is confusion and one wonders if it is intentional. The label "biodegradable" is now used ubiquitously. So the consumer is deceived into believing that this is an environmentally sound choice in a product or packaging. The compostable bag is biodegradable only in the industrial composting environment and is meant to be disposed of in that environment.

"Instead of getting serious about moving away from single-use plastic, corporations are hiding behind the pretense that their throwaway packaging is recyclable," said John Hocevar, oceans campaigner at Greenpeace.

Vegware, the maker of compostable bags used in the study (2), said it had updated its description of its bags label to say: "commercially compostable where accepted."

## THE CHASING ARROWS & CHASING HABITS

There is "biodegradable plastic." Let's be clear - biodegradable plastic is made from fossil fuels and end up creating microplastics. The industry marketed the word biodegradable in a successful attempt to continue manufacturing plastic. The clue is that it still is labeled PLASTIC.

Biodegradable packaging is commonly thought to be made only from bio-based or plant-based materials. But the truth is that's not true. Biodegradability depends on the molecular structure and strength of a material's polymer chain rather than its source. To biodegrade, the polymer structure (string of monomers) that make up the material must be able to disintegrate, or breakdown, into tiny pieces that can be safely digested by microorganisms. This means biodegradable packaging can be made from bio-based and fossil-based polymers! (3)

The bottom line is that "biodegradable" is a tricky term when it comes to calling a product green, and it can be downright deceiving, providing a false sense to consumers that they're making smarter choices.

In 2015 the Federal Trade Commission warned 20 marketers and sellers of dog waste bags that their biodegradable and compostable claims may be deceptive, providing information on truth-in-advertising principles when making environmental claims.



# THE CHASING ARROWS & CHASING HABITS

## Wastefulness

Each year, approximately 500 billion - 1 trillion plastic bags are used worldwide.

The mantra that has been drilled into our psyche "Reduce, Reuse, Recycle" needs updating to "Refuse, Rethink, Reuse or Repurpose." Everything we consume has waste attached to it. Recycling gives us a good feel about our waste, that we did right and can forget about it. Greenpeace says that plastics cannot ever be regarded as compatible with a circular economy, because each time we recycle them, they become more dangerous to our health and the health of the planet. (°4)

Biodegradable and compostable bags have a bigger carbon footprint than one has considered. They may or may not use fossil fuel, but they continue to use and deplete natural resources such as plants, the land for growing, water, probably fossil fuel production energy and greenhouse gas emissions and fuel of some sort to transport them. One needs to consider the life cycle of these bags.





# THE CHASING ARROWS & CHASING HABITS

## Chasing Habits not Arrows

So how do consumers crack the code?

Perhaps this is when you change your habits. There is no real need to take a single-use bag of any sort, is there? If you are one of the people who support reducing our fossil fuels consumption, this is the ideal habit to change and be committed. Bring your own produce bags. If you forget to bring them in your car or into the store, go back to the car to retrieve them or simply place your produce in the cart naked. This may be your one-trial-learning experience so you won't forget the next time. And do not consider paper bags - they have 7 times the carbon footprint than that of plastic bags.

The paradox scenario is when shoppers use these produce plastic bags, whether compostable or biodegradable, and then will have them placed in their reusable bags. We need to avoid waste and not perceive it as inconvenient (as in "An Inconvenient Truth").

The Rappahannock Group wants to encourage the public to be increasingly mindful of individual habits. Sometimes we trust that our stores and companies are doing the right thing so we think we need not research nor question their practices. Technology is advancing quickly and marketing plays a significant role. Let's make every effort to clean up our habits for the future generations.

1 <https://www.theguardian.com/environment/2023/may/18/recycling-universal-symbol-chasing-arrows>

2 <https://www.nationalgeographic.com/environment/article/biodegradable-shopping-bags-buried-for-three-years-dont-degrade>

3 [en.m.wikipedia.org](https://en.m.wikipedia.org)

4 <https://www.theguardian.com/world/2023/may/26/friday-briefing-why-recycling-plastic-may-not-be-as-good-for-the-planet-as-we-thought>

## NUCLEAR NEWS

*by Victoria Gallaway*

The Lake Anna nuclear reactors were intended to have a life cycle of 40 years, yet they have recently been granted a second 20-year extension, doubling their intended lifecycle. The first reactor became functional in 1978 and the second in 1980. Now, they will be running until 2058 and 2060. Together, the Lake Anna plants provide 17% of Virginia's electricity and power 450,000 houses. There are plans in the works for the construction of a third nuclear reactor at the same site. Virginia is currently dependent on four reactors to provide the bulk of the state's nuclear energy. The North Anna and Surry plants together produce 31% of Virginia's electricity.

The extension of Lake Anna's power plants creates some uneasiness, as there was a 5.8 magnitude earthquake in 2011 which exceeded the threshold of what the plants were built to sustain. It is not common for nuclear reactors to experience such an unexpected event, and has raised concerns about whether it is safe for them to remain open without more comprehensive examinations.

Virginia is looking to increase its energy sources to meet a growing demand. Much of this demand has come about due to an influx of data center proposals. Companies are looking at placing Small Modular Nuclear Reactors (SMnRs) near data centers as a potential solution.

The name Small Modular Nuclear Reactor succinctly sums up its use. They are "small" in the sense that they take up a fraction of the space of a normal nuclear reactor, such as the ones seen in North Anna or Surry. They are "modular" because, instead of having to be built on site, they can be manufactured in a factory and then transported elsewhere. They also perform the same nuclear fission reaction of larger reactors, just on a smaller scale. The main benefit to SMnRs is that they can be implemented more cheaply and theoretically faster than larger reactors. However, there are concerns with Virginia being the testing ground for this unproven technology.

## Get Involved!

Come to one of our educational talks or outings events!

If you want to learn about other ways to get involved, email us at [RappahannockGroupSierraClub@gmail.com](mailto:RappahannockGroupSierraClub@gmail.com)

## Donate

Support the work we do by donating to the Sierra Club.

[Click here](#) to donate.

## Vote

A reminder to go vote on November 5th if you haven't already! Make your voice heard!



## Save the Date

Earth Day on the Rappahannock this year will be on April 26, 2025 from 11-4pm at Old Mill Park. Save the date!