

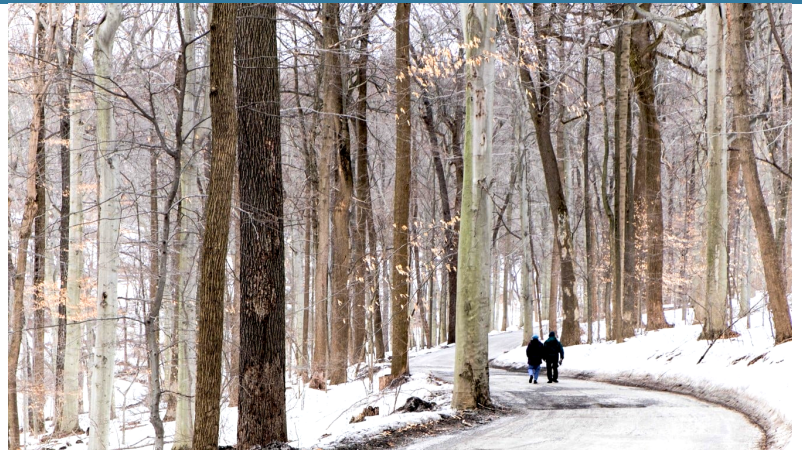
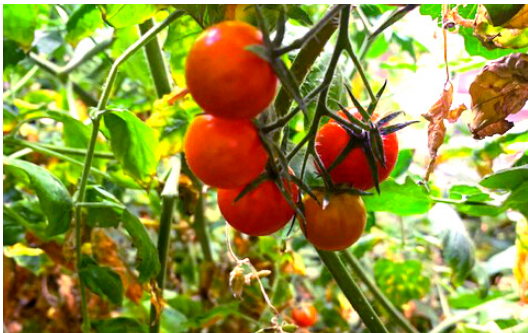
# SSAFE Newsletter

Senior Stewards Acting for the Environment



## In This Issue

### Hydroponics Update



*The campus at Kendal-Crosslands Communities is beautiful in the wintertime. Photo source: Kendal Corporation.*

### Better Fleet Efficiency

How to benefit the climate and the bottom line.

### Climate Change Through the Lens of Frost Dates

A longer growing season requires us to adapt.

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## How are we heating our campuses?

*By George Alexander, Kendal at Longwood*

It may not be as simple as you think. If you asked me “what fuel do you heat with at Kendal-Crosslands?” my quick response would be “electricity.” Our cottages and apartments use electric heat. Pretty simple, right?

But the full answer is more complex. Our central buildings are heated by circulating hot water— heated in natural-gas boilers. So natural gas is an important source of heat. Our maintenance center is heated by propane. And our Farmhouse, the building that was already on the property when Kendal first acquired it, is heated using fuel oil.

*cont'd p.2*

# Heating (cont'd)

So we burn natural gas, propane, and fuel oil for some of our heat. Still, most of our heat *is* electric.

And what’s the source of all that electricity? Our electricity comes from the grid. In our section of the grid (called the “PJM Interconnection”), about 40% of the electricity is produced by turbines that burn natural gas. Nuclear generation is a strong second at 33%. A lot still comes from burning coal for steam to turn a turbine (20%), though that is being phased out. And a small (but rapidly growing) part of our grid electricity is from renewables (currently about 7%).

Fuel	Percentage of Generation
Natural Gas	40%
Nuclear	33%
Coal	20%
Wind	4%
Hydro	2%
Solar	1%

*Fuels used for generating electricity in the PJM grid region for the 12 months ending 11/1/22. Data downloaded from [www.PJM.com](http://www.PJM.com).*

So actually, when I say we use “electricity” for some of our heat, I’m really saying that we indirectly use natural gas, nuclear power, coal, and some renewables.

And that’s not even the whole story: when a winter storm takes out our power lines, our emergency generators kick in. They run on diesel fuel. So almost every winter, we get a little bit of our heat from

electricity generated by burning diesel. Here is a table showing our annual utility bills and how each fuel contributes to our carbon footprint:

Fuel	Amount	% of carbon Footprint
Electricity	15,302,002 kWh	88.2%
Natural Gas	14,087,600 cu ft	8.8%
Gasoline	20,544 gallons	2.1%
Diesel	3,503 gallons	0.4%
Propane	5,492 gallons	0.4%
Heating Oil	553.7 gallons	0.1%

*Fuel usage at Kendal-Crosslands Communities based on utility bill totals. The rough carbon footprint calculation includes only direct uses of fuel, not the fuel embodied in our food, in deliveries, in employee commuting, etc. Data is for calendar year 2020.*

We don’t know how much of each fuel is used for heating. We do know that heating is one of our biggest uses of electricity, but of course electricity is used for many other things. Natural gas is used for heating our Centers, but it is also used for our laundry, for heating our pools, and for cooking. Gasoline, on the other hand, is not used for heating at all; and most of the diesel fuel we buy is for vehicles, not our emergency generators.

The rough calculation of our carbon footprint in the table above shows that our electricity accounts for the lion’s share. At many other Kendal campuses, that won't be true. In general, the primary heating fuel for a given campus is likely to be the main component of that campus's carbon footprint.

*cont'd p.3*

# Heating (cont'd)

How do we get to carbon neutrality? If our goal is to get Kendal-Crosslands to carbon neutrality by 2050, we will have to eliminate all of our uses of fossil fuels, both direct (burning natural gas, propane, and diesel fuel on campus) and indirect (through our use of electricity generated using fossil fuels). There are three essential steps in getting there:

1) Make our buildings as efficient as we can. We can't afford to waste energy because of poor insulation, leaky windows, and the like.

2) Use electricity for all heating. That will mostly require switching to highly efficient heat pumps, perhaps using geothermal wells in some cases.

3) Use only renewable electricity. The grid is moving toward an all-renewable future, but it may not happen fast enough to make our 2050 target. If not, we will need to procure all-renewable electricity in another way (either using our own solar generation or by procuring electricity from a vendor that generates it renewably).

Although every Kendal campus uses a unique array of heat sources, each campus will ultimately need to use these same three steps to wean itself from fossil fuels for heating.



## Heating Fuels at Kendal Campuses Cover a Broad Spectrum

A sampling of a few Kendals shows that the heating scenarios can be very different:

- At Hanover, **propane** boilers heat water that heats the entire campus, including the common areas.
- Lathrop heats its cottages and apartments using **natural gas**. Some residents have added mini split heat pumps, and others have contracted with community solar organizations, but the primary heat source remains natural gas.
- At Oberlin, most of the independent-living cottages are heated with either **geothermal** installations or **air-source heat pumps**. **Natural gas** heats the apartments, community facilities, and healthcare wing.
- Ithaca heats its campus primarily with **natural gas** (80-85%).
- Lexington uses **natural gas** as the predominant heating fuel for their campus.

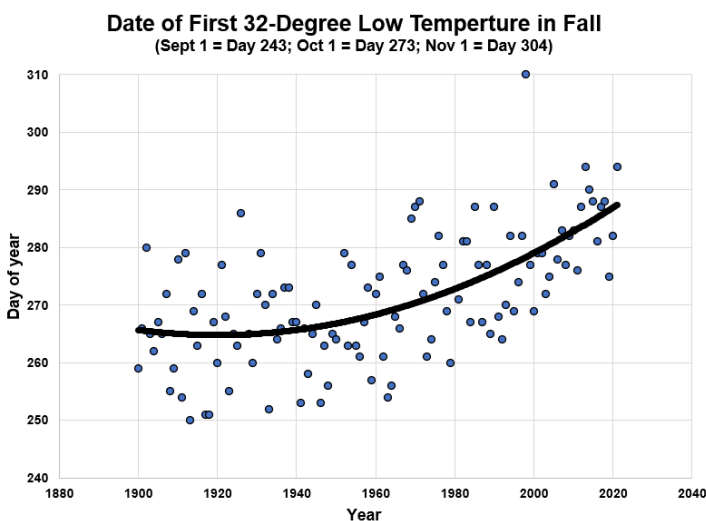
Electrification of heat sources is an important tool in lowering our carbon footprint. Fortunately, advances in heat pump technology are making this goal more achievable for all.

# ARE WINTERS MELTING AWAY? A Gardener Looks at Climate Change

By David E. Henderson, PhD, Kendal at Hanover

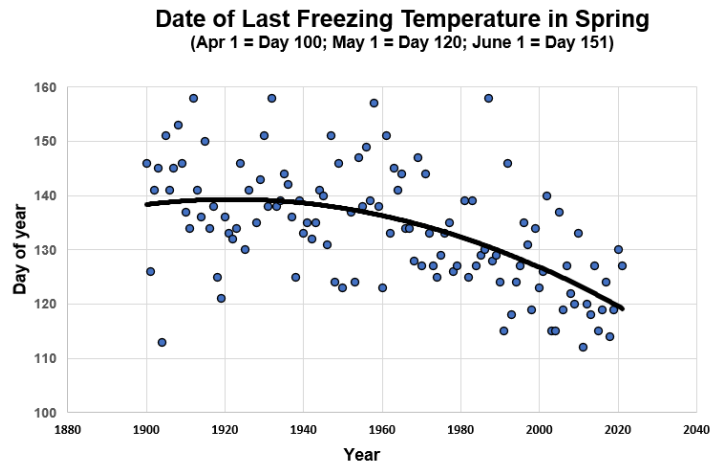
Gardeners around the world have noticed the fact that fall frosts happen later and later. In the 1980's I would begin covering tomatoes in mid-September in Connecticut. Now, I don't bother until mid-October, and by then the tomato plants are mostly done anyway.

The approach of frost this year raised the question of just how much frost dates have changed. I downloaded data on daily low temperatures in Hanover, New Hampshire, from NOAA[1]. First, I identified the last spring frost date and the first fall frost date by looking for low temperatures of 32 degrees F or below. Then I made three graphs. The first graph shows the date of the first fall low temperature at or below 32 degrees F. The trend is clearly toward later frosts. But the other surprise in the data is that the variability of the first frost has decreased as the climate warmed.

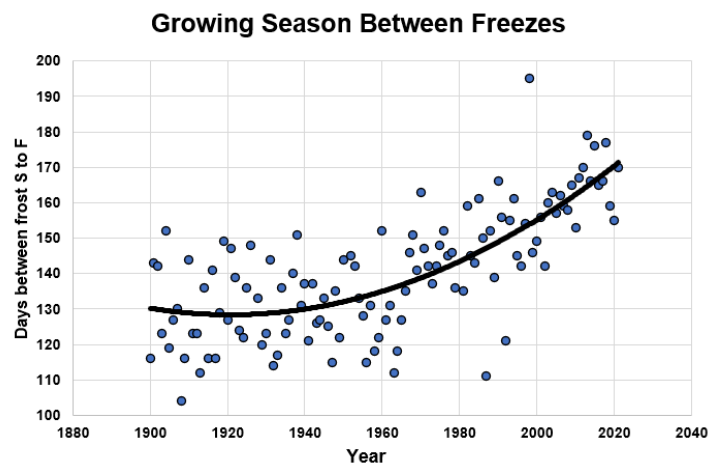


The second graph shows the date of the last freezing temperature in the spring. The trend is clear. In both cases, the trend line changes by about 20 days, for a total

change of 40 days of extended growing season. The change in variability is even more pronounced in the spring data.



Finally, we can graph the number of days between freezing temperatures in the third graph.



The overall change of about 40 days is clear, along with the lower variability.

As a gardener, this is all good news if I adjust the old rules of thumb about when to plant. And earlier planting means more spring sunlight.

*cont'd p.5*

# WINTERS MELTING (cont'd)

As a human being and citizen of planet earth, however, I recognize this is bad news. It makes clear how much we have changed the climate. While it works well here in New England, there are places where it will become impossible to grow traditional crops due to heat or drought.

That's why the Environmental Protection Agency (EPA) has included "length of growing season" as one of its climate change indicators[2]. Not just New Hampshire but almost every state has witnessed a longer growing season. Though the change varies in different parts of the country, on average an increase in the growing season of more than two weeks has been observed in the contiguous 48 states since the 20th century began. The last 30 years have seen an especially greater increase.

## The length of the growing season is a key climate change indicator used by the EPA.

Why does this matter? In the view of the EPA, an increased growing season could result in both benefits and harms. Farmers might be able to grow a wider variety of crops or obtain several harvests from their land. On the other hand, a longer growing season could limit which crops a farmer could grow, require more water for irrigation, and allow invasive species and weeds to move in.



*The frost is arriving later and leaving earlier all over the world. Photo source: Canva*

It could also wreak havoc on the area's ecosystems, in particular affecting the habitat of local wildlife.

The length of the growing season, together with other climate change indicators like severe weather, is concrete and observable to the average person. It's more evidence that temperatures are rising due to human-caused emission of greenhouse gases and an important metric in our efforts to track the effects of climate change.

[1] <https://www.ncei.noaa.gov/access/past-weather/03755> Accessed October 3, 2022.

[2] U.S. Environmental Protection Agency. Climate Change Indicators in the United States. Accessed October 2022. [www.epa.gov/climate-indicators](http://www.epa.gov/climate-indicators).

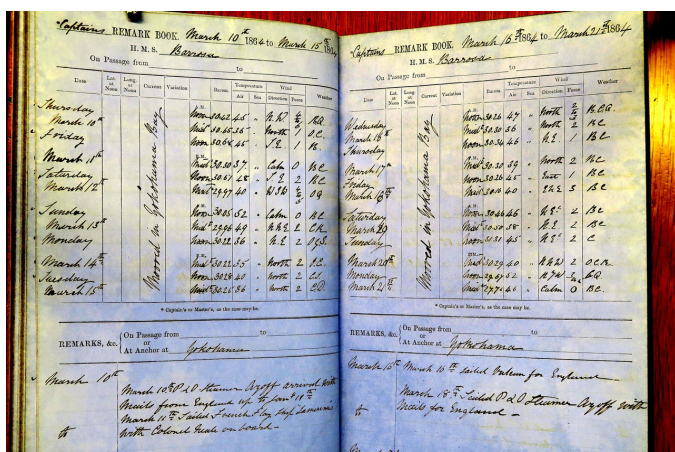


# CITIZEN SCIENCE—An Answer to “What Can I Do?”

By Ted Burrowes, Kendal at Lexington

Yes, you *can* do something really significant! You can track trends in climate change. It’s called citizen science, and it’s a relatively easy way for you to get involved. Regardless of age, ability, knowledge level, or skillset, people are needed to help gather scientific data. Sound conclusions derive from having many people measuring, monitoring, and collecting data on a large scale, over a wide geographic area.

One such project entails transcribing temperatures recorded in weather logbooks from 19th century ships. While there is fairly rigorous information on global temperatures in the 20th century, this project allows you to help extend our climate knowledge further back in time. You may have to decipher some old-fashioned script, and an internet connection is definitely required, but if you’re looking for a way to make a difference, this might be it.



Historical ship weather logbook from the mid-19th century. Reproduced with permission.

To learn more:

<https://www.zooniverse.org/projects/p-teleti/weather-rescue-at-sea>

## Citizen Science in Action

Each day Tim Sterrett, Kendal at Longwood, steps out late in the evening to read the rainfall gauge and record the precipitation. In the cold weather, he might have to walk to a parking lot to measure snowfall on the cold, flat roof of an automobile.

Tim is the fourth resident to monitor rainfall, which has been a commitment at this campus since January of 1982. He posts precipitation amounts daily in Kendal’s main center, but like most citizen scientists, his work falls under the auspices of another organization—in this case the county, to whom he reports his findings monthly. The county combines his data with that provided by other citizen scientists who are part of the Volunteer Rainfall Observer Network to get a better picture of trends in precipitation.

Like the length of the growing season (see p. 4), precipitation is another EPA climate change indicator. The amount of rain and snow an area receives can affect water supply, flood risk, and the kinds of animals and plants, particularly crops, that can live in that area. Tracking changes in precipitation can help identify disruptive trends and foster adaptation strategies.

For more information:

<https://www.chesco.org/3188/Volunteer-Rainfall-Observer-Network>

## THE HYDROPONICS LAB IS GROWING

By Gina Bosworth, Kendal at Longwood

We first wrote about the hydroponics lab in the January 2022 issue of this newsletter. Now we want you to know that the quest for fresh, tasty, high-quality produce to offset the cost of buying it commercially is alive and well at Kendal at Longwood. Hydroponics can grow lettuce and herbs at 70% less cost than growing them traditionally in soil—no pesticides and long-haul trucking—which explains why Culinary Services has spearheaded the lab and still stands behind it.

Since its inception, the hydroponics lab has been able to provide more and more produce with each harvest. Now they are looking to expand in more substantial ways.

### Produce can be grown at 70% less cost with hydroponics.

To that end, the hydroponics team took a field trip to the only commercial-size aeroponics (vertical hydroponics) greenhouse at a retirement community in the nation. At Garden Spot Village, they have 200 10-foot lightweight, vertical towers inside a greenhouse. Water and nutrients run down the inside of the growing columns to feed the plants. Tomatoes, chives, peppers, kale, and rosemary are popular crops, and they're available even in the cold months.

The Kendal team also visited Red Acres Hydroponics in Worton, Maryland. They



*Mature, hydroponic lettuce ready to be harvested and served on a resident's salad plate.*

have an extensive hydroponics array in 3 large greenhouses, using the sun as much as possible to grow plants without soil in a typical horizontal layout. They have the ability to customize what they grow depending on customer demand. In addition to gathering ideas on how to expand from these larger farm operations, Gina and the energy group have researched freight farms, which use a typical shipping container to house a hydroponics farm.

Another option being considered is expanding into bigger indoor space. Regardless of how the next steps for the hydroponics lab unfold, the team has achieved its goal. Residents now have an opportunity year-round to eat local, fresh, healthy produce free of preservatives and pesticides—food the way it's supposed to be.

For more information:

<https://www.gardenspotvillage.org/village-life/greenhouse/>  
[www.freightfarms.com](http://www.freightfarms.com)

## ON THE ROAD TO A MORE FUEL-EFFICIENT FLEET

*An interview with Roy Manno, Facilities Director, and Alex Dowd, Mechanic, Kendal-Crosslands Communities*

It's a safe bet that most vehicles driven on Kendal campuses are powered by gasoline or diesel. But that's changing here at Kendal-Crosslands Communities, where we're committed to reducing our carbon footprint by making our fleet more fuel efficient. We see this as a great opportunity to achieve our sustainability goals.

Take "Coco," for example. About a year ago we bought the Coco Coupe, an all-electric golf cart, which has a horn, lights, seat belts, windshield wipers, roll-up windows, heat, air conditioning—everything that makes it a comfortable all-weather vehicle—despite being a golf cart. It reaches a top speed of around 25 mph, but that works fine for getting around our two main campuses. And, it's saved us money.

We bought the Coco Coupe for \$10,000—half of what a traditional all-weather golf cart would cost. Despite a few technical problems, mechanic Alex Dowd sings its praises. According to him, it's a maintenance dream. You see significantly less wear and tear than with other golf carts because there are fewer moving parts. You don't have to worry about changing the oil or coolant leaks. It's only tires and breaks that need attention. The increased longevity reduces vehicle replacement costs, and fuel costs go down about 40%. Financially, Coco is a big win.

Of the 12 golf carts we own, one quarter are electric: Coco and two other all-electric golf carts. As carts wear out, we are



*The all-electric Coco Coupe golf cart is good for the environment and good for the bottom line.*

replacing them with electric ones. It's a gradual process, but it allows us to move steadily forward to reach our goals. The golf carts are untagged, but we have 30 tagged vehicles in our fleet that provide an opportunity to improve fuel efficiency at turnover: 14 pickup trucks, 9 minivans, 5 buses, and 2 SUVs. The SUVs—Toyota RAV4 hybrids--were recent replacements for less fuel-efficient vehicles. The plan is to replace two Ford F150 pickup trucks with smaller-engine pickups like the Toyota Tacoma or Tundra. Going from V8s to 4 cylinder vehicles can make a big difference. The team is also hoping to do this replacement with fully electric pick up trucks.

We've also looked at opportunities to transition to battery power in our Grounds department. For example, we invested in an electric push mower for an interior courtyard, 3 electric leaf blowers, and 2 electric string trimmers. Used primarily in

*cont'd p.9*



## ON THE ROAD (cont'd)

enclosed residential areas, they don't have the traditional gas odor and are less noisy.

Recently, we purchased "Mo," a robotic, battery-powered lawnmower. He has a designated area of 1.6 acres that he maintains, circumscribed by an underground wire. He mows until he reaches about 25% of his battery life. Then he automatically goes back to his dedicated carport and recharges for 30 to 45 minutes or so. (He also "sleeps" there.) Minimal oversight is required—Alex can do it on his iPhone.

We bought Mo from Husqvarna, a Swedish manufacturer of outdoor power equipment, for \$5,000. The costs range from \$1,800 to \$5,000, so Mo is top of the line, with all sorts of bells and whistles added for safety. For example, Mo has no rotary blades. If anyone or anything gets too close to Mo, he tucks his blades inside, shuts off, and sends an alert to Alex's phone.

From a maintenance standpoint, Alex can attest to the fact that upkeep on Mo is easy. He requires no fuel, no oil changes, no new tires. Mo has just 2 little razor-type blades that Alex changes twice a year—at a cost of only \$20.00 a set. Otherwise, minimal maintenance is needed.

What about financial advantages? Reduced maintenance and fuel costs are certainly significant, but the biggest advantages are in labor savings. Mo provides the equivalent of a groundskeeper mowing that area for 1 hour once per week. This



*Mo, the robotic lawnmower, is a leading example of our commitment to sustainability.*

frees up staff to be redeployed to other areas where they're needed. If the mowing were previously contracted, Mo allows us to cut back on contracting costs.

Overall, the scale comes down heavily on behalf of benefits: Mo is cost-efficient, labor-saving, requires minimal maintenance and oversight, and is good for the environment.

The pesky geese Mo chases away don't like him much—but residents love him!

For more information:

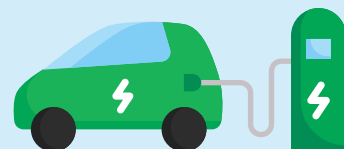
[rmano@kal.kendal.org](mailto:rmano@kal.kendal.org)

<https://www.cococoupe.com/>

<https://www.husqvarna.com/us/robotic-lawn-mowers/>

**How much will it cost to charge your EV at your Kendal?**

*Find out in the next issue!*



By Larry Daloz, Kendal at Hanover



*A woman holds up a protest sign as young people march through the COP27 venue. Photo Source: LWF/Albin Hillert.*

## Highway to Climate Hell?

Every year the nations of the world come together to seek agreement on how to slow climate change, and each year the sense of urgency grows keener. “We are on a highway to climate Hell with our foot on the accelerator,” said UN Secretary General Antonio Guterres, hoping to encourage stronger action among rich nations (most responsible for climate deterioration) to fund poor nations who have done least.

Here are five things that were noteworthy about this year’s conference:

- Plagued by fossil fuel lobbyists, logistical snafus, and battles between protesters and Egyptian police, the first week was “unusually chaotic.”
- The second week brought clearer focus on the central issue: the effort to reach agreement on a financing mechanism to address “loss and damage” suffered by poor nations.

- As the rate of climate change has outpaced the speed of negotiations, the focus began to shift from “mitigation” (efforts to address the causes of warming) toward “adaptation” (efforts to defend against the effects).
- Despite fierce efforts from fossil fuel interests, the conference held to its target of limiting global warming to 1.5 degrees Celsius, compared to pre-industrial era levels—the goal set by the Paris Agreement.
- For the first time in the 30-year history of the conferences, the leadership ultimately reached agreement on the formation of a loss-and-damage fund within the next year, though details are sparse.

## The central issue: reaching agreement on a financing mechanism to address "loss and damage."

Global events of this magnitude might seem remote to our lives, but they represent an important reminder of what SSAFE is trying to do. Indeed, all of our initiatives are focused on supporting the goals of the Paris Agreement. We should not forget that the agreement is a legally binding international treaty on climate change signed by 196 countries. And its goals are SSAFE’s goals, and those of each and every one of us. Going forward, our mission is clear.

## BOOK REVIEW

By Barb Smith, Kendal at Longwood

### The Brilliant Abyss: Exploring the Majestic Hidden Life of the Deep Ocean and the Looming Threat that Imperils It

By Helen Scales

“Mom, if you care about climate change, you need to look at the ocean.” With that, my son handed me Helen Scales' book, *The Brilliant Abyss*. Scales, a marine biologist, journeys into the Deep Ocean, dazzling us with the beauty and fragility of the creatures who live there.

Oceans are vast carbon reservoirs, Scales explains, and produce more oxygen than all the terrestrial plants on earth. However, the deep sea is threatened by pollution, plastics, and proposals to mine the sea floor for mineral rich nodules, which contain cobalt, nickel, copper, and manganese—metals that some argue are essential to transition from fossil fuels to green energy.

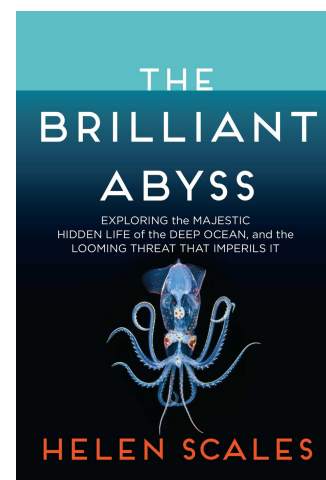
On average, the ocean's floor is 12,500 feet down, roughly 2½ miles below the surface. There are V-shaped trenches as deep as 7½ miles and dramatic mid-ocean mountain ranges rising two miles from the ocean floor and stretching 34,000 miles. Flowing from these mountain ranges are the abyssal plains, where most of the mineral rich nodules are found.

Scientists have only begun to discover life in the deep sea or contemplate what its biodiversity can contribute to our world.

In 2019, for example, 17 lead scientists published the results of a 3-year study in which they had photographed 347,000 animals, only one in five of which were known species.

Still, in mid-October 2022, the first deep-sea mining trials began in the Pacific Ocean. The International Seabed Authority, which governs deep-sea mining beyond states' territorial waters, still has no regulations in place to monitor environmental impacts or enforce protections.

Commercial operations are likely to begin by 2024. Scales concludes, “what science is saying is that deep-sea mining ... would pose dangerous risks to biodiversity and the environment, on timescales and intensities that cannot yet be fully quantified, but could be catastrophic and permanent.”



Learn more:

<https://www.nytimes.com/2022/11/03/world/deep-sea-mining.html>

# Wrapping Up

## A SSAFE Welcome Tea



*Mary Burton, SSAFE Chair, and Mary Ann Cadwallader, SSAFE Education Team member, host a tea so residents can learn more about SSAFE.*

Kendal at Hanover held their second SSAFE event for newcomers, inviting everyone who had become a Kendal resident since the lemonade social was held in the summer.

The group started by sharing people's special experiences with nature. They then moved on to discuss SSAFE—the education, advocacy, and greening groups that make up the organization and the goals and accomplishments of each. Some people became members right away, using the computer made available on site!

Cookies and cider attracted passersby, so next time a sign will be placed at the entrance inviting all those interested in learning more about SSAFE to join in. The hope is for even more participation at the third tea sometime near Earth Day.

## Donate Today!

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SSAFE uses these funds to support efforts such as guiding senior living campuses to net-zero emissions, climate advocacy, and climate education. Senior Stewards Acting for the Environment (SSAFE) is a 501(c)(3) nonprofit corporation. EIN: 87-1229514.

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SSAFE newsletters can always be found at [SSAFE.org/newsletter](https://SSAFE.org/newsletter)

## SSAFE Newsletter

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## Submissions & Comments

We want your feedback! We're always looking for good stories to provide inspiration to other senior living community residents. Send us your articles, ideas, questions, or comments!

We'd love to hear from you—drop us an email at [info@SSAFE.org](mailto:info@SSAFE.org)