



Fresh Air

The Newsletter of the Mid-Hudson Group of the Atlantic Chapter

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Chair's Corner

by Lalita Malik

Change. It is the only constant in life. The variable factors are the rate and nature of change. We cannot control external factors that cause change, but we do control how we react and adapt to them. For example, there has been an influx of people moving out of New York City into the Hudson Valley. Therefore, we have a need for more housing, which can place environmentally sensitive land at risk. Developments that are planned properly and built in areas that are suitable for them are welcome. But lately the number of large, proposed developments with adverse impact on the environment are increasing. It is Sierra Club's mission to protect the environment, and we have stepped in when necessary.

Marie Caruso represented the Mid-Hudson Group in a battle against a concrete slab and steel fabrication plant in the midst of Bluestone Wild Forest. After almost six years of public hearings, multiple reports, and lawsuits, the project may be doomed by the fact that a study by Paul Rubin has found special features on the site resulting in its nomination to the State and National Registers of Historic Places. Check Marie's report for more information.

The Village of Philmont is threatened with development on a hill above Summit Lake. With help from Karen Schoemer, Sierra Club member, we organized "A Day in Philmont" to visit Philmont, see the lovely village and meet the residents. Visit Instagram @sierramhg to see pictures of our day and a summary of our activities.

A Call to Action:

JOIN THE MARCH TO END FOSSIL FUELS

**September 17th - 1PM - New York City
Meet at 56th Street and Broadway**



**JOIN THE MARCH TO
END FOSSIL FUELS**

The United Nations is calling on world leaders to take real steps to lead us off fossil fuels to protect people and the planet. On September 20th in New York, the UN Climate Ambition Summit will gather world leaders to commit to phasing out fossil fuels.

Thousands of supporters will take to the streets before the summit to demand President Biden take bold action to end fossil fuels.

ORGANIZATIONAL PARTNERS

[Click here for full list](#)

Note: Sierra Club is an organizational partner

Bring: Friends, Family, and signs

Chair's Corner *...continued*

In addition to a tour of the Village, we enjoyed a delightful tour and lunch at Feniello farm.

Nivo Rovedo's "Perspectives on the Electrical Grid", discusses changes that must be made to utilize the full benefit of renewable energy versus the desperate attempt by some to stay with the status quo and continue to burn fossil fuel, ignoring the havoc caused by continuing to do so. Resisting change is counterproductive.

Sarah Kennedy's review of "Islands of Abandonment" is an upbeat perspective on the planet's ability to heal itself. If we change our behavior and stop destroying our environment by reckless use of natural resources, the planet will repair itself. Sarah has listed many sites where we see proof of nature's resiliency.

Sun and wind powered energy depends on weather and time of day. Battery storage has come a long way and it is now a viable option for storing excess electricity produced by solar and wind, for use when required. In addition to battery storage, "Pumped Storage" is now a viable option for storing excess electricity. Christopher Parks discusses pumped storage in his article.

Soon we will organize outings to visit those sites and see for ourselves. In March, three members of the Mid-Hudson Group, John Rath, Christopher Parks, and I received Outing Leader certification. We plan to lead outings in areas of interest such as the ones Sarah mentions and have more outings like the "Day in Philmont".

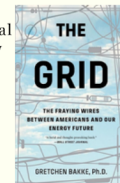
Over the last few years, technology has brought us the capability of virtual meetings across geographies. They save time, traffic on the road, and save emissions that contribute to global warming. Marie Caruso organized our first hybrid meeting in March, which was a roaring success. Read about it in her report and if you missed that meeting, click on the links in her article to view the program at your leisure. We plan to bring more hybrid programs to you in the future.

We will continue to embrace change and take advantage of the benefits they provide. And we will continue to help our members in their fight to save the community character of their home towns.

Perspectives on the Electrical Grid by Nivo Rovedo

Several years ago, I wrote an article for "Fresh Air" about a book I had read entitled "The Grid". The author warned of the fragility of the nation's electrical infrastructure: how it had not been maintained with suitable investment; how it was vulnerable to terrorist and state-sponsored cyber-attacks; and how urgent upgrades were needed if we were to "electrify everything" with renewable green energy sources.

Much of what the author was suggesting has been experienced in the past few years. In 2021, there was a spectacular failure of the grid in Texas during a prolonged cold snap. The failure was reportedly brought on by a lack of investment in adequate weatherization of the grid and the desire to remain independent



Perspectives on the Electrical Grid ...continued

of the national grid system. Texas is currently struggling to meet the overwhelming demand brought on by a heat dome that is bringing record temperatures to the state. This is a global problem - Beijing and parts of India are also broiling.

There have been attacks on the grid with news reports across the country of electrical substations damaged by gunfire. While solar and wind continue to build out generation capacity, there are laments that the abundant electricity created is having to be "curtailed" (turned off and wasted) because the grid cannot always handle the energy generated at peak production times, and that this energy is often unable to reach the most needy regions due to bottlenecks in transmission. For instance, New York City is not always able to avail itself of the abundant electricity generated in the upstate regions because of a lack of adequate power line capacity from the Utica area south. Conversely, this inadequacy also impacts energy providers who are unable to benefit from the high-demand market. It should be pointed out that the development of off-shore wind in the NY Bight promises to get power to the NYC-Long Island demand centers in the upcoming years.



The fragility of the grid was presented in a recent article in The New York Times, "[Power Grids Are Teetering Worldwide. Here's Why](#)" in which Manuela Andreoni discusses the record demand for energy, quoting Michael E. Webber, a professor of energy resources at the University of Texas:

"Many kinds of machinery don't work as well under extreme heat. Power plants, transmission lines and even the air-conditioners in our homes work less effectively when it's hot out....This increases demand, or strain on the grid. At the same time, the grid is less able to keep up with it... So, it's like a double or triple whammy."

The article notes the irony that to meet demand, countries such as Mexico and China are stocking up on coal to generate electricity, while Texas plans to build more methane gas-powered plants for the same purpose, yet burning these fossil fuels is the very cause of the extreme heat and climate change.

Very importantly, as our society struggles to move away from fossil fuel electrical generation, we need to address the mismatch between renewable energy generation and demand: solar and wind are intermittent but demand is always present, even though it rises and declines throughout each day. Rather than waste electricity at daily peak production if

Perspectives on the Electrical Grid ...continued

production is higher than demand, we need to effectively store excess generation, so it can be utilized when the renewable energy generation is low, such as at night with photovoltaic (solar) production. While wind and solar are somewhat complementary, in that wind generation is often higher when solar generation is lower, a more highly tuned and optimized methodology is needed to even out supply and demand.

On this last point, many proposed storage solutions are being examined, from pumped hydro (in which excess power is used to move water against gravity to a higher reservoir, from which it can be released later for generation), to utility scale batteries, to compressed air in caverns or old mine shafts, and others.

Batteries have gained a great deal of traction, as technological progress and cost reduction have made them more attractive. Our Mid-Hudson Sierra Club chair, Lalita Malik, pointed me to a [newsletter article](#) about a scheme for coordinating the distributed power available in the myriad smaller-scale batteries connected to the grid. Many solar companies now offer residential battery systems, which are a great complement to home solar panels. They work as a gas-powered generator would to provide power to your home during an outage, without burning fossil fuel. An incremental benefit is that in the event that an outage occurs during the day, the battery enables the solar system to continue to generate power to the home as well. This suggests that there may be a great deal of useful, distributed, stored power available to provide grid resiliency during an outage, which could be controlled in a "smart" way to keep the lights on.

The article also focuses on [sonnen](#) (lower case intentional), a company that uses software to coordinate many small sources of stored energy as virtual power plants. The author, Dan Gearino, explains... "Since its founding in 2010, the company has been a leader in emphasizing how batteries can serve a larger function than just backup power, and it has developed software to manage groups of batteries. The company is among the market leaders in home-based energy storage in Europe but is a smaller player in the United States. Its rivals include Tesla and LG Chem."

As electric vehicles (EVs) continue to grow in share of the overall automotive market, they also might represent a substantial battery power source using bi-directional "smart" chargers, which allow power to flow from the EVs to the grid when needed if the car is charged and connected to the grid. I recall several years back when the Union of Concerned Scientists was already exploring this idea. ("[Updating the US Electricity Grid](#)", Catalyst Magazine, volume 19, Fall 2019)

Central to the plan of upgrading and updating the grid are the regulatory and local hurdles to building out renewable generation and transmission infrastructure. While regulation and oversight are critical in protecting the environment, the process can sometimes serve to slow progress unnecessarily. The same is true of community feedback in such projects: people who are living in areas to be affected by the work deserve a voice, but NIMBYism can impact endeavors that would serve the greater good.

An example might be when a community opposes the installation of a cable bringing power from offshore wind farms through their town, despite the minimal impact to the "local character". The goal must be to ensure that the final result is both sound from an

Perspectives on the Electrical Grid ...continued

environmental and community perspective as well as executed with a sense of urgency to implement these important projects.

In an attempt to speed up renewable energy projects, the Climate Leadership and Community Protection Act (CLCPA), passed in NYS in 2018, created an alternative agency called the Office for Renewable Energy Siting (ORES), which reviews applications on a fixed timeline to prevent long, languishing delays. Previously, all projects, whether dealing with fossil fuel build out or renewable energy, ran through so-called Article 10 review, which was notorious for its drawn-out timelines. Few renewable energy projects came to fruition. ORES cuts through some of the red tape and sets the amount of time for each step, so developers know the time scale they are facing. Although the environmental evaluations are basically the same between the Article 10 and the ORES procedures, the latter cuts out the ones that do not apply to solar and wind, eliminating the inherent delays and costs such vetting entails. With ORES, many new clean, green energy projects have been initiated, helping NYS do its part in reducing pollution and destruction from climate change.

You may have heard the news in early June that a small overpass section of the very busy and economically critical I-95 highway in Philadelphia collapsed when a tanker truck was engulfed in flames under it. The prevailing thought was that it would take months to repair, and that a re-routing of traffic through local streets would be a nightmare. In reality, the interstate re-opened after only two weeks or so, on June 23, thanks to some innovative thinking and focus on cutting the bureaucratic approval procedure. Local and federal authorities rapidly pushed through an innovative and definitely outside the box plan to build a retaining wall around the underpass and fill it with recycled glass, a quick and secure technique, and then pave over the top. A permanent fix will be required in the long term, but this story demonstrates what can be accomplished if we apply ourselves intelligently and with focus. We need the same for the build out of renewable energy infrastructure to save ourselves from the worst of the climate crisis.

Bluestone Forest Garners New Attention

by Marie Caruso

Paul Rubin's March 25 program highlighting the historical & geographical features of the Bluestone Wild Forest, sponsored, in part, by your Mid-Hudson Sierra Club, was very well attended, both in person and online. The program can still be viewed through this [Facebook link](#).

Paul Rubin's studies have gone far to enhance awareness of the forest's special features as well as to further its pending nomination to the State and National Registers of Historic Places. Very recently, an excellent article by Susan DeMark describing these features has been published in the "Explore" magazine section of "Hudson Valley One", which can be [seen here](#).

This enhanced awareness of the forest's special features can't help but put renewed scrutiny on the plans, still pending, to build a concrete slab and steel fabrication plant in the midst of the forest, on private property at 850 Route 28, just ¼ mile east of Onteora Lake.

Bluestone Forest Garners New Attention ...continued

Although it continues to be used for storage of heavy equipment and construction materials, at this point, any further development of the site faces three major hurdles:

1. The Town of Kingston's Planning Board's decision of 2 years ago, requiring the developer to produce a Draft Environmental Impact Statement (DEIS) and undergo a comprehensive review under SEQRA. (No DEIS has yet been filed).
2. The determination, by the NYS Office of Historic Preservation, that the site should be assessed by a qualified industrial archaeologist for any historic resources that might be impacted by construction.
3. The NYS DEC's November 2021 Notice of Violation and Cease and Desist order halting all construction activities until the site has been remediated and a stormwater discharge plan has been approved.

There is little more to say about this threat right now, other than to applaud the strong environmental activism that has put a hold on these plans for an industrial development within the Bluestone Wild Forest. Any construction activities observed on the site, which adjoins Pickerel Pond, should be reported immediately to the Region 3 office of the DEC, as well as to Catskill Mountainkeeper's Kathy Nolan, who holds monthly meetings with the ad hoc advocacy group, Friends of Bluestone Wild Forest. We will continue to monitor this issue and inform our readers if there is anything new to report.

Book Review: Islands of Abandonment

by Sarah Kennedy

Islands of Abandonment: Nature Rebounding in the Post-Human Landscape by Cal Flynn came onto my radar when it won the John Burroughs Medal in 2022. This annual award, begun in 1926, is given to the author of a distinguished nature book. Looking over the list, Flynn is in excellent company. I previously reviewed the 1977 winner, Aldo Leopold's *A Sand County Almanac*, and the 2005 winner, Robin Wall Kimmerer's *Gathering Moss: A Natural and Cultural History of Mosses*.

Flynn's book provides a surprisingly hopeful take on the planet's ability to heal itself. She writes vividly about a wide variety of scenarios, often seeing the upside as she pays close attention to what has come to pass. On the other hand, she also provides a vivid warning should we not heed nature's message. Flynn does not minimize the likelihood of catastrophic climate change if we don't give nature the space and time to heal itself.

While writing this book, Flynn travels to locations around the world which are abandoned, and/or devastated in some way, and left generally uninhabited or only lightly visited. Abandonment can be due to naturally occurring events such as massive volcanic eruptions. More often, places are abandoned as a result of human behavior—sometimes of deliberate, self-serving, and foreseeably devastating human action (think results of profit-seeking, and corporate greed), sometimes through more benign processes (think abandoned farmland), sometimes created out of conflict where it is not safe or is forbidden for people to go (think demilitarized zones), and it may be the result of tragic accidents (think Chernobyl).

Book Review: Islands of Abandonment *...continued*



Through her research, Flynn learns to see things from a unique perspective. When visiting deeply damaged sites, Flynn is able to see that the altered landscapes show signs of repair and life. Some sites seem wild again, akin to pristine, protected areas, yet they have been profoundly changed. This is an amazing finding.

After looking at brownfields studies where a huge variety of invertebrate life was recorded, Flynn writes: "A remarkable feat, given that most brownfield sites have usually been in existence for only a few decades—when a woodland might take hundreds of years to come to full maturity and ecological complexity."

We see examples of nature's return to areas left abandoned in the Hudson Valley. When hiking at Mohonk and Minnewaska, or at Scenic Hudson's Black Creek Preserve, we can see old stone walls and foundations where farms once stood. While these protected areas feel wild now, they were once open farmland. Much of the woods in this country is re-forested.

The Shawangunk Grasslands National Wildlife Refuge provides a rare (one of two in the region) breeding area for Short-eared Owls, Northern Harriers, Eastern Meadowlarks, Horned Larks, and Bobolinks. It was created on the site of the Galeville Military Airport which was decommissioned in 1994. It is well worth a visit to this special habitat.

It is also interesting to visit sites where nature is regaining ground on land that was once industrial, or held other larger buildings. Mount Beacon Park, Long Dock Park, West Point Foundry Preserve, and Franny Reese State Park are a few such sites. All provide good examples of how nature works to restore an ecosystem when given half a chance.

Some of what Flynn says is counterintuitive. She explains why environmentalists may advocate against clean-up of certain areas that are so damaged as to be dangerous for humans to enter: to clean them up would result in a return of people and a loss of a safe environment for plants, animals and birds to live and breed in.

Book Review: Islands of Abandonment *...continued*

One place this happens is in demilitarized zones when ordinance left behind keeps people away, yet animals or birds are too light to detonate it. In one example, in Kurdistan there are millions of land mines that were planted during the Iran-Iraq war. Humans enter this area at great risk to life and limb. As a result, the endangered Persian leopard thrives there. "Although the big cats weigh up to one hundred and eighty pounds, they rarely put all their weight on paw, and thus escape death by the Soviet-era munitions."

Cleaning up military debris often, but not always, happens after war. This renders the sites as perilous as ever for endangered species once man returns. There are options to preserve the gains made during abandonment. Flynn provides some examples in which the previous combatants realize the value of that land and end up working together: "...the unplanned nature preserves that have formed up in buffer zones have come to serve as a focus for bilateral cooperation after hostilities are over."

Included is another interesting example of how badly things can go wrong when humans tinker with ecosystems. Flynn visits an experimental arboretum built by German colonial powers in Tanzania in 1902. After Tanzania gained independence from German then British rule, and war began with Uganda, funding disappeared and the arboretum was no longer supported. Now, only one caretaker remains on site. What occurs next is a fascinating story about invasive species which are now spreading there like wildfire.

The risk created when non-native plants and trees escaped in Tanzania leads Flynn to think of John Muir. He is of special interest to Sierra Club members as the founder of this organization. Flynn writes: "Cautionary tales like these serve to underline the significance of long, entangled ancestral history. To paraphrase John Muir: when one tugs at a single thing in nature, he finds it hitched to the rest of the world. Tug hard enough, and we risk the whole beautiful tapestry coming undone."



Energy News Central: Off-River Pumped Hydro Storage

by Chris Parks "Scanning Energy News So You Don't Have To"

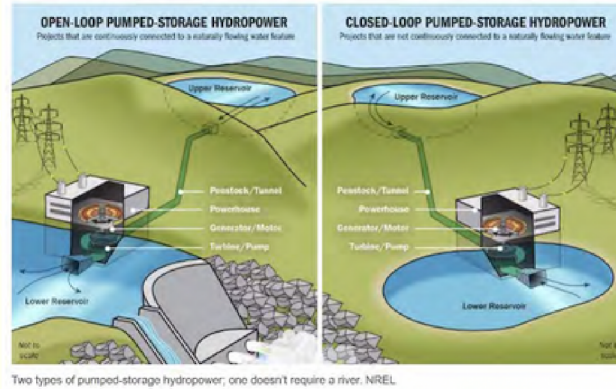
I am a person who enjoys gathering information from many sources to stay attuned to scientific and engineering developments, particularly in the area of energy. This provides substance for a course I present at the Marist Center for Lifetime Study called "Energy Storage for Renewables Transition." For the Spring 2023 session, I became aware of what I see as a spectacular idea in the area of energy storage. It is called off river pumped storage.

You are no doubt familiar with "hydro power": basically, a flow of water turns turbines to generate electricity. Most often, this implementation involves a dam built in a bottleneck pinch point of a flowing river, which forms a reservoir; the water in the reservoir then is funneled through the turbines to convert the water's kinetic energy into electrical energy.

Energy News Central: Off-River Pumped Hydro Storage

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In a sense, the reservoir is a stored source of energy, which must be replenished by the river that flows into it. A variation on this occurs when water that has run through the turbine is pumped back into the reservoir; this methodology is used when there is excess energy from generation, when supply is greater than demand, so as to not waste the generated energy but store it for later on. For example, say the wind is blowing well and a great deal of electric power is available, more than is being consumed; rather than stop some of the generation (termed "curtailment"), thereby wasting this potential generation, the energy is used to replenish the source by pumping it back up into the reservoir, to be used when needed (say when the wind dies down but demand is still present). The innovation put forward on this concept by off river pumped storage came when an Australian group realized that very minimal water is needed in a closed loop and many sites for this arrangement exist.



Instead of having the water flow away in a river, the same water could be used over and over. By having an upper and lower reservoir and the ability to pump water back up from the lower reservoir, such a system could run without a continual need for more water: charge water during an initial fill and then just restore evaporative losses.

This requires a suitable topography in the landscape, for an adequately higher and lower elevation for the reservoirs, of course; but it appears many areas have enough hills for this. The idea is getting traction in arid places like Utah. The technique provides renewable, greenhouse-gas-emission-free power (although care needs to be taken in siting and building the reservoirs to minimized environmental damage).

Energy News Central: Off-River Pumped Hydro Storage

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Utah, Wyoming, and Nevada have several off-river applications in place. Portugal, San Diego, and Pennsylvania are building Pumped Storage facilities (rivers can always be the lower reservoir.) As a point of interest, our oldest 1926 Pumped Storage site is at Candlewood Connecticut.

What I find fascinating in this Australian analysis, besides the relative abundance of potential sites for technology, is the relatively small amount of water needed for this system to be effective. A pair of 250 acre reservoirs next to a 2000 foot drop gives 1 GWatt of energy storage for 24 hours, enough for a city of a million people. Only a gallon per person per day is needed, equivalent to a 20 second shower. They called this concept off-river pumped storage because the best hydro sites are not on rivers at all. The good sites blanket the arid US West and the Appalachians. An article in *The Conversation* demonstrates that just a few hundred sites would support a 100% renewable US electricity system.

In the current push to de-carbonize the grid, batteries get hyped, but pumped hydro provides the vast majority of long-term energy storage essential for renewable power. Pumped hydro storage is often overlooked in the U.S. because of concern about hydropower's impact on rivers. But what many people don't realize is that most of the best hydro storage sites aren't on rivers at all. Pumped hydro energy storage may play a key role in advancing wind and solar renewable energy by fixing the intermittency issue of those sources, filling the need for storing the excess energy that can used in low-generation times (say, at night for solar).

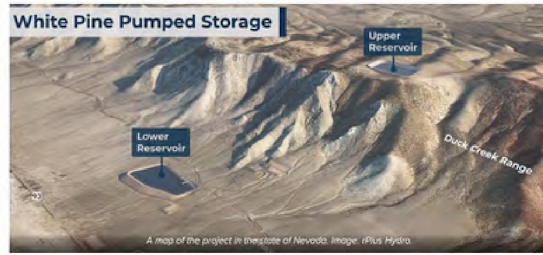
Nearly all of the good sites are located away from rivers, for the simple reason that most of the global landscape is not near rivers. I always thought that most of the good hydro opportunities were taken long ago, but the Australian National University's Global Pumped Hydro Atlas lists 616,000 sites with a combined storage capacity of 23 million GWh, which is about 100 times more than is needed to support a global 100% renewable energy system.

Here is an example of such a proposal. A company called rPlus has applied for a license to build the White Pine pumped hydro storage site in Nevada, which would have a full power output of 1000MW and be able to discharge that for eight hours, making it an 8GWh system. That would serve about an eighth of Nevada's peak power demand on a hot summer day, the company said.

rPlus said that the site meets all the other requirements of a pumped hydro site. These are: a large vertical drop over a short distance, a topography that is amenable to building reservoirs, a nearby source of water for initial fill and occasional re-fills, nearby transmission infrastructure, geology that supports engineering and long-term operation underground, and "no or low" environmental impacts.

In Utah alone, there are nine projects in 2023 with permits to try off river pumped storage: one at 300MW, four at 500MW, one between 500-1000MW and three greater than 1000MW. Pumped hydro storage appears to be capable of being a dominant technology to even out the intermittency of solar and wind, with greater than 500 MW power production and day to month storage times (compared to 4 hours typical for a large utility battery facility).

Energy News Central: Off-River Pumped Hydro Storage



rPlus Hydro has submitted a Final License Application for a pumped hydro energy storage (PHES) plant in Nevada, US, its second Application in 2023.

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The energy recovery is good at 70-80%, and the response time is quick at about 30 seconds. No fancy battery metals are needed.

So, to summarize, my research has turned up a source of energy storage which I had not considered.

Pumped off-river hydro storage may well be a key to a sustainable all-electric energy future: the complete surprise to add hilly regions where no capacity existed or was even imagined.

For the big picture, Hydro dominates energy storage at 160 GWatts or 90% of global capacity. New York, New England, and Quebec are blessed with enormous 37 GWatts traditional Hydro - the low-hanging fruit to balance solar and offshore wind energy. Grid storage batteries are making impressive advances, knocking out methane peaker plants in the critical sunset to midnight time slot. But batteries are a story for another article.

Outings: “A View from the Clean Energy Future”

Please join us on: Thursday September 21, at 7pm

Location: Boughton Place, 150 Kisor Rd Highland.

For a presentation “A View from the Clean Energy Future”

RSVP: mhsierraprograms@yahoo.com

We are at the beginning of an energy transition away from highly polluting energy sources to cleaner and safer ones. Over the next thirty years, the world will transform in some expected – and some unexpected – ways. What does that look like for the average household, and for the community and larger scales? What technology exists today for this transition, and what hard problems remain to be solved? And what will be required for this to be successful?

Come learn what the world will look like, and how you can make it happen sooner. Join us to learn about what is in store for us.

Our presenter is Sean Dague, who is a volunteer with Citizens' Climate Lobby, a volunteer driven grass roots organization that exists to create the political will for a livable world by enabling individual breakthroughs in the exercise of personal and political power. He leads the Mid-Hudson Chapter of CCL and is a State wide volunteer coordinator.