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The Appalachian VOICE

October/November 2016

Then & Now

Updates on stories from across the years

Navigating the Russell Fork



Poised to bolster a flagging economy, one river also faces threats from coal mining

Also Inside: Cultivating Climate Resilience | Afrilachian Poets | Technology in the Silicon Holler

Holston Ammunition Plant's Open Burning Raises Citizen Concern

By Kevin Ridder

The Holston Army and Ammunition Plant in Kingsport, Tenn., is under scrutiny for disposing explosives and contaminated materials by burning them out in the open. The plant's Title V air pollution permits, which grant them exemption from state open burn laws, are up for renewal this year through the Tennessee Department of Environment and Conservation. A public comment period ended in September.

Kingsport residents Mark and Connie Toohey, members of environmental activist group Moms Clean Air Force, have been fighting to limit the plant's air pollution since 2011.

"During open burns, [the explosives] produce a lot of cyanide as well as [nitrogen oxide]," wrote Mark Toohey during the public comment period.

"We're up high enough that we can see pretty much whenever they're burning," says Connie Toohey. "The smoke has even blown up into our house. When

you're in town, where little kids are playing and swimming, you might be able to smell it but you can't really see it. It isn't right."

Under Tennessee law, Holston's Title V permits are granted if "there is no other practical, safe, and/or lawful method of disposal." Mark Toohey cites the Louisiana Camp Minden military facility as an example of alternative disposal. A contained burn unit was established there last year after public outcry against open burning of propellants.

Justine Barati, Director of Public and Congressional Affairs for Joint Munitions Command, stated through email that once the possibility of sending waste to an on-site landfill at the Holston facility has been explored, different technologies will be reviewed to reduce open burning. The plant expects to decide on a course of action by September 2017.

Tennessee environmental regulators do not have a timeline for making a decision on the air pollution permit renewal, according to an agency spokesperson.

Wildlife Initiatives Expand in East Kentucky

In July, the Kentucky Department of Fish and Wildlife Resources announced the creation of the Rockcastle River Wildlife Management Area, which comprises more than 2,900 acres in eastern Pulaski County. According to the Commonwealth Journal, the parcel — known by many as the Ikerd Coal property — was purchased for \$6.3 million from the Ikerd family using funds levied from a tax on firearms and ammunition sales. The property is expected to open to the public soon.

In August, the Appalachian Wildlife Foundation finalized the purchase of a

former industrial park in Bell County, Ky. According to the Associated Press, the 500-acre property was purchased from the Pine Mountain Regional Industrial Development Authority for \$700,000.

The property is surrounded by an additional 1,200 acres leased by the foundation, according to the Harlan Daily Enterprise. Together the properties will house the Appalachian Wildlife Center, which is expected to open in 2019 and will provide a wildlife refuge, a museum of natural and regional history and an astronomy pavilion. — Elizabeth E. Payne

Emerald Ash Borer Finds Its Way to North Carolina

The emerald ash borer, or *Agrilus planipennis* fairmaire, is a shiny green beetle that is destroying ash trees throughout the Appalachian region.

According to the Emerald Ash Borer Information Network, the beetle has already killed hundreds of millions of ash trees in North America.

An infestation can be spotted by the "D" shaped holes on the leaves of the ash trees that the beetle will eventually

kill. The loss of ash trees is detrimental to biodiversity, forest industries and property owners across the country.

Campers, hikers and drivers should watch for falling trees and branches near ash trees.

Moving firewood is one of the main causes for the spread of the emerald ash borer. Experts suggest using locally sourced firewood to prevent infestation. — Tristin Van Ord

Southwest Virginia Environmental Movement Loses Two Leaders

By Willie Dodson

In August, Southwest Virginia lost two environmental leaders who leave behind legacies of service to the land and people of Appalachia.

Vivian Owens of Haysi, Va., was a founding board member and long-time super-volunteer for the Friends of the Russell Fork, a local organization dedicated to protecting the river. Owens worked with community members and AmeriCorps volunteers to monitor the health of the river and identify and remove sewage straight pipes and other sources of pollution in the Russell Fork and its tributaries.

Tim Mullins of Pound, Va., served on the board of the Southern Appalachian

Mountain Stewards for many years. Mullins' contributions of time, energy and talent — notably his art and photography — helped SAMS win an eight-year campaign to defeat a more than 1,200-acre mountaintop removal coal mining permit on Ison Rock Ridge in Wise County, Va.

"He loved the Appalachian Mountains and all of God's creation and worked diligently to protect them from those who destroy them for profit," longtime friend Jane Branham wrote after Mullins passed. "He was a man full of courage ... he learned to fly, traveled the world, embraced his gay identity in the face of conflict and violence committed against him and was always a voice for others who could not speak out."

The National Park Service Turns 100

By Tristin Van Ord

August 25, 2016 marked the 100th birthday of the National Park Service.

The agency has been hosting events all year in honor of the centennial.

Shenandoah National Park is celebrating with the "Centennial Quilts Tour," which will display quilts at multiple locations around Shenandoah with scenes from all of the national parks.

Other parks throughout Appalachia are recognizing the centennial as well.

The New River Gorge National River, Great Smoky Mountains National

Park and the Appalachian Trail are celebrating with 100-mile hiking challenges. Hikers can record the miles they've hiked in each park online at the National Park Service website. The challenge started in January, but hikers can record miles until December 31 at New River Gorge and the Appalachian Trail, and until December 6 in the Smoky Mountains.

The Blue Ridge Parkway is honoring the centennial through their "100 ways" website, which offers different events and activities that visitors can engage in during their travels.

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Monumental Momentum

Increased advocacy and a push for presidential action create renewed momentum for the proposed Birthplace of Rivers National Monument

Editor's note: A version of this article first appeared in the July 2016 issue of Blue Ridge Outdoors Magazine and is republished here with permission.

By Danielle Taylor

What will be President Obama's legacy? The Affordable Care Act? The death of Osama bin Laden? Or perhaps his public lands legacy. President Obama has designated or expanded 27 national monuments and protected more than 550 million acres of public lands and waters, more than any other president.

Unfortunately, only 23 of more than 120 current national monuments are in the East. West Virginia currently has none. However, a group of Mountain State conservation advocates, businesspeople, outdoor recreation enthusiasts

and other citizens has organized to secure a federal designation for the proposed Birthplace of Rivers National Monument.

"There are no landscape-scale national monuments in the East," says David Lillard, special projects manager with the West Virginia Rivers Coalition. "There's a need and a worthiness in the East as well."

Where is the Birthplace of Rivers?

The proposed national monument centers on the existing 47,815-acre Cranberry Wilderness, which lies within the Monongahela National Forest in east-central West Virginia and drains via the Cranberry and Williams Rivers. To encompass



Birthplace of Rivers National Monument advocates Matt Kearns and Adam Swisher journeyed the entire 173 miles of the Elk River by canoe, bike and foot to generate interest among other paddlers for the proposed national monument. Photo by Chad Carpenter / West Virginia Rivers Coalition

the headwaters of the adjacent Cherry, Gauley, Elk, and Greenbrier Rivers, the monument boundaries strategically include approximately 75,000 additional acres, also within the national forest, in two sections along the Monongahela's northeastern and southern borders.

The naturally diverse area already attracts hikers, mountain bikers, paddlers, anglers, hunters and other outdoor enthusiasts. Increased awareness of the area could bring more visitors to the "wild and wonderful" landscape. Protecting the area as a national monument would provide a wide range of benefits for West Virginia, where a West Virginia Rivers Coalition poll showed that 84 percent of voters support the proposal.

Why create a national monument? First, says Lillard, a national monument designation, unlike a national forest, would permanently protect the land from industrial development, a significant step in this fossil fuel-rich state.

Second, this measure would help ensure the purity of the rivers, a critical step given that millions of people downstream depend on them every day for fresh, clean drinking water. Just two and a half years ago, a massive chemical spill into the Elk River polluted more than 300,000 people's tap water, which highlighted the vital need to protect this resource. Clean headwaters also facilitate positive recreation experiences downstream for fishing and paddling. More

than 90 percent of West Virginia's native trout streams fall within the proposed monument's borders. And creek boaters flock to the headwaters of these rivers.

Third, says Lillard, a monument designation would help guarantee that any future logging remains at a sustainable level.

Finally, the designation of the monument would significantly boost tourism revenue throughout the area. According to an economic impact study commissioned by the West Virginia Wilderness Coalition, the monument's designation would create 143 jobs, increase visitor-related spending in communities surrounding the monument by 42 percent, and generate more than \$14.5 million in economic output annually. Similarly, land-management research group Headwaters Economics studied the local economies of communities bordering or adjacent to 17 national monuments in the western United States from 1982 to 2011, and they found that jobs grew at four times the rate of similar communities that didn't have a national monument as a neighbor.

How can it be designated?

National monuments can be created either by a majority congressional vote or by a signed presidential designation under authority of the Antiquities Act. "We'll take it either way," says Lillard.

continued on next page

Monumental Momentum

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The International Mountain Bicycling Association and the West Virginia Council of Trout Unlimited have also joined in advocating for the monument. And over the past several months, Lillard has witnessed many local community members adjacent to the proposed Birthplace of Rivers site evolve from skeptics to advocates.

"There's been a strong groundswell of local support around the area where the monument would be," he says. "They're self-organizing and have local leadership on the ground with more plans to boost community engagement. A number of outdoor and tourism businesses have been rising up and saying they really want this for West Virginia. We even have Birthplace of Rivers info centers' now. At 14 local shops, they have maps people can take and postcards at the counter."

In mid-May, Lillard and three Pocahontas County, W.Va., advocates traveled to Washington, D.C., to meet with representatives from President Obama's administration to discuss the Birthplace of Rivers proposal. Upon arrival, they delivered 1,500 letters of support for the monument to the president.

"Around the beginning of this year, the focus of this campaign shifted strongly toward the president," Lillard



The highland forests of the Cranberry Wilderness would retain its high level of protection if the national monument is designated. Photo by Geoff Gallice

explains. "He has indicated there will be more monuments designated. We've been meeting with his administration's monument people for a long time, and they're very interested."

A presidential precedent of sorts exists for departing commanders-in-chief to establish 11th-hour public lands on their way out the door. For example, during the first seven years of President Clinton's two terms in office, he designated one national monument. In his last year, he established 19, with seven of those only becoming official in his last week and a half in the White House.

What happens next?

Although many West Virginians have fully embraced this proposal, others have expressed concerns that the national monument designation might restrict access to the area, especially since the management plan for the landscape wouldn't be fully developed until after the president or Congress approves the designation. The West Virginia state chapter of the National Wild Turkey Federation has expressed concern over the president's potential use of the Antiquities Act to establish the monument, which in their view would be a federal backdoor that bypasses public approval.

To ease these concerns,

Lillard explains that sustaining current levels of access both now and for future generations is one of main motivations guiding the designation push.

"For the most part, we would take the current management plan," he says. "Our proposal calls for some more restorative forestry, spruce in particular, but most things would continue to be what they are now. We feel like the proposal addresses the concerns, and we welcome anyone to voice their concerns. One of the biggest developments over the past few months has been that many former opponents are now at the table and see how the monument can be good for West Virginia and how they can have a role."

If designated, the monument would remain under the management of the U.S. Forest Service. In a January 2013 letter to the then-president of the Pocahontas County Commission, U.S. Forest Service Chief Thomas Tidwell wrote that, "Typically, as has been the situation on recent Forest Service monuments, monument designations

complement the underlying management plan — which is developed with public input. If hunting and fishing are permitted under the current forest management plan, that would typically continue as a national monument."

Lillard agrees. "National monument status would allow the Forest Service to continue to manage it. We are not trying to create a national park, and we certainly don't want to create more wilderness there or exclude people using it currently. What's there now is what we want to keep. There are other types of protection, and we think this is the highest level of protection available."

To help increase publicity for the proposed monument, in May paddlers and Birthplace of Rivers advocates Matt Kearns and Adam Swisher spent two weeks journeying from the Elk River's headwaters in Southern Monongahela National Forest to the mouth of the river in Charleston. Throughout the "Elk-spedition," they shared information about the proposal with everyone they met. On the final day of their adventure more than 100 fellow Birthplace of Rivers advocates joined in for a flotilla escort of the last few miles.

In a blog post, Kearns describes a day where the duo had the river to themselves. "It was great to have such solitude, but the best part of Elkspedition has been meeting so many West Virginians on and along the river," he says. "We can tell that support for designating Birthplace of Rivers National Monument is strong here."

Said Swisher afterwards, "As President Obama wraps up his second term, designating this monument would be a significant way to ensure his lasting legacy in the Mountain State." ♦

Learn more at birthplaceofrivers.org






Categories include Adventure, Blue Ridge Parkway, Our Ecological Footprint, Culture, Flora/Fauna and Landscape. The Our Ecological Footprint category, sponsored by Appalachian Voices and Mast General Store, highlights the impact that people have on the natural world. \$4,000 in cash and prizes available.

Submissions are open until 5:00 p.m., November 18, 2016.

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Presented by ASU Outdoor Programs, Turchin Center for the Visual Arts, and Virtual Blue Ridge. Sponsored by Mast General Store.

Image details, clockwise from top: Drew Bennett, Cathy Anderson, Jeffrey Stoner. All images were finalists in the 13th Annual Appalachian Mountain Photography Competition.



The stunning Falls of Hills Creek in the Monongahela National Forest are part of the proposed Birthplace of Rivers National Monument. Photo by Samuel Coleridge




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American Kestrel A Winged Predator Fights to Survive

By Dan Bieker

Nothing signals death to an unwary vole or grasshopper more suddenly than the piercing cry of a kestrel patrolling overhead. Sadly, that once-familiar call echoing over farms and fields is growing ever more silent.

The American kestrel is North America's smallest falcon and a proud symbol of the country's rural heritage. Like its cousin the peregrine falcon, kestrels are sleek, agile and incredibly powerful for their size. Compared to most hawks, falcons are speed demons — think of an F16 fighter jet versus a B52 bomber.

All native predators are critical in food chains, and the kestrel is no exception. Unfortunately, this handsome bird of prey is disappearing over much of its range, especially in the northeastern and mid-Atlantic states. Populations in the United States have declined by half since the late 1960s according to the North American Breeding Bird Survey, a massive data collection effort overseen by the U.S. Geological Survey.

Reasons for the decline are not fully understood, but culprits include monoculture farms, loss of open areas, competition from European starlings for nest sites and increased pesticide use. The neonicotinoid family of insecticides is especially harmful. Evidence continues to mount on the toxicity of these widespread chemicals to birds and other wildlife. Neonicotinoids also dramatically reduce the quantity and

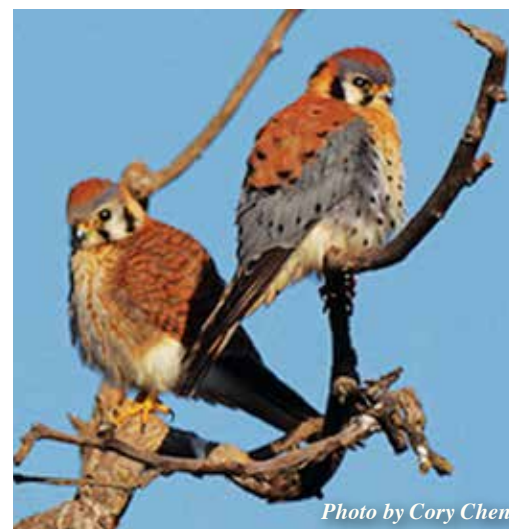


Photo by Cory Chen

diversity of insects, and kestrels are voracious insect predators.

Only about the size of a blue jay, kestrels reign terror from above. They patrol over pastures and other open areas, or sit patiently on utility wires, ready to pounce on whatever small critter lands in their sights. Besides voles and grasshoppers, they also prey on mice, moles, shrews, lizards, frogs, snakes and — rarely — small birds.

Kestrels range over most of North America, with northern birds generally more migratory than their southern counterparts. They are primarily denizens of farmland and prefer open areas with short ground cover and scattered trees. Look for them on utility wires or exposed tree branches.

With most raptors it can be difficult to distinguish gender, but not so with kestrels. They are the most colorful of all

raptors, with males spouting striking blue-gray wings and females a rich, tawny brown all over.

Cavity nesting is another relatively unique attribute of kestrels. Usually that means that they nest in old woodpecker holes, but kestrels will utilize a wide variety of opportunities, including holes in buildings and even the open ends of pipes on utility towers. Three to five eggs are laid and incubated for a month before hatching. The chicks then spend roughly another month in the nest before fledging.

Fortunately, kestrels take readily to artificial nest boxes, which

presents an opportunity for the public to help. Most state wildlife agencies can provide helpful information on how and where to erect kestrel nest boxes. Local bird clubs can also be of assistance. The Kentucky Department of Fish and Wildlife Resources maintains a kestrel nest box project on public land.

In the winter of 2014-2015, the Virginia Society of Ornithology began a five-year project to build and install kestrel nest boxes throughout the state. Project volunteers — nicknamed the Kestrel Strike Force — seek out suitable sites, knock on doors to get permission, then erect a box at no charge to the landowner.

Boxes are placed on trees, sides of outbuildings, or, preferably, extended on treated two-by-fours and attached to fence posts. Most are raised about 12 feet above ground and oriented in an east to southeast direction. There is no maintenance involved for the landowner, but they are requested to report any activity in and around the

box to the Strike Force, which maintains ongoing records. The project is funded through donations, and all aspects of the endeavor are carried out by volunteers.

To date more than 240 boxes have been erected in 30 Virginia counties. While installing boxes, the Strike Force endures mud, barbed wire, ticks, chiggers and livestock of questionable temperament, but it carries on!

A frequent question asked by those unfamiliar with kestrels is “will they eat my chickens, my cat or my poodle?” Once those fears are allayed, most folks are happy to host a box and take pride in knowing they are helping this fascinating little falcon continue to grace the countryside. ♦

Learn more at virginiabirds.org

Dan Bieker is an assistant professor of Natural Sciences at Piedmont Virginia Community College in Charlottesville, Va., and board member of the Virginia Society of Ornithology.



The volunteer Kestrel Strike Force provides nest boxes for the falcons in Virginia. Photo courtesy of Virginia Society of Ornithology

What You Can Do

- ♦ Build and install your own nest box if you have suitable habitat. Other birds that might use the box (and should be welcome) include bluebirds, tree swallows, flickers and screech owls. Starlings and squirrels — no!
- ♦ Enhance habitat by preserving brushy areas, keeping old fencerows in place, leaving dead trees standing (where safe) and encouraging native plants.
- ♦ Hawk Mountain Sanctuary in Pennsylvania has excellent information on kestrel biology and building and erecting your own nest box. Visit tinyurl.com/hawkmntkestrl
- ♦ The American Kestrel Partnership also has information on kestrels and nest boxes, including a video of a female kestrel fighting a starling that is trying to take over her box. Learn more at kestrel.peregrinefund.org

Thermostats, Insulation and Water Heaters

Save energy and money with these home projects

Story and photos by Adam Sheffield

The inevitable colder temperatures of winter can lead to rising energy costs — is your home ready? To help you prepare, Appalachian Voices recently produced several short videos where energy efficiency experts demonstrate ways to lower your home's energy use. These straightforward upgrades can lower your energy bill

as well as help you protect the environment by consuming less energy.

Below are several tips and energy-saving projects from the “Heating and Cooling” and “Water Heating” videos that you can do yourself.

To watch instructional videos about these and other home energy efficiency projects, visit appvoices.org/energy-diy



Harper Robinson of Conservation Pros connects a water heater blanket by applying insulation tape.

Heating & Cooling

John Kidda of reNew Homes, Inc., in Boone, N.C., discusses the energy saving benefits of using programmable thermostats as a way to save on heating and cooling bills.

Programmable thermostats allow residents to set the temperature in their home based on their schedule, removing the need to leave the air

conditioner or heat running on high while away at work or asleep. During winter, set the thermostat to a lower temperature while you're away from home or in bed, and program your thermostat to increase the heat right before you normally come home or wake up. Some thermostats can even be adjusted from a mobile device.

Kidda points out that when a

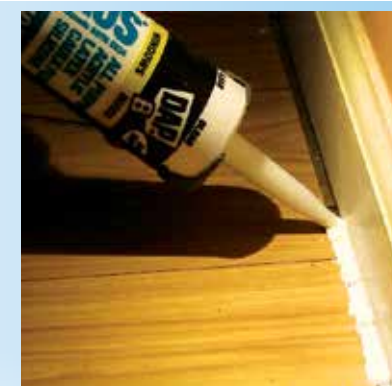
home is properly insulated and air leakage is minimized, the thermostat can be set to lower temperatures because heat is not being lost. “One interesting thing is that once you better insulate a house and make it less drafty, you actually will feel more comfortable at a lower temperature,” Kidda says.



Turning down your thermostat in the winter uses less energy and saves money.

Insulation & Air Leakage

Harper Robinson, project manager with Conservation Pros in Asheville, N.C., demonstrates proper installation of crawl space insulation and sealing of attic drafts in this video. According to Robinson, insulation should be positioned with the paper side facing the direction you want to keep warm. Insulation can be held in place by using short metal rods between joists in the crawl space. Robinson also applies a spray foam



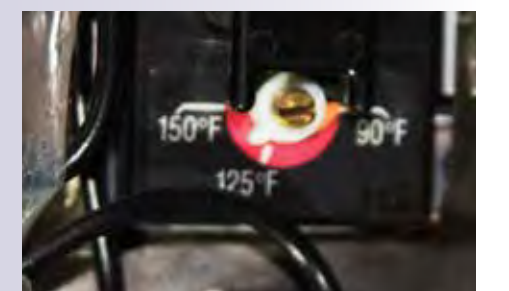
Caulking cracks and crevices reduces air leakage to unfinished areas of your home.

sealant to an attic's gaps and crevices, inhibiting air from escaping the finished areas of the home.

Water Heaters

Keeping a home's water heater at an appropriate temperature is a simple way to save energy. Remove the tank's small access panel and locate the temperature dial. Adjust the dial up or down with a small coin or screwdriver. Optimal temperature settings release shower and tap water that is hot to the touch without having to be diluted with cold water. When temperatures are too high, the tank uses more energy to maintain consistently hot water and risks scalding skin. But water heaters should be set to at least 120 degrees Fahrenheit to avoid bacterial growth inside the tank.

Robinson explains that wrapping your



Slight turns of the dial adjust the tank's temperature.

tank with an insulation blanket can maintain heat within. Another way to retain warm water is to wrap the first few feet of pipe coming out of the tank with pipe-specific insulating material, such as foam tubing or insulation strips. ♦

BUILDING BETTER SPONSORED BY



A Window Into Smart Energy Use

Every building uses energy in one form or another. Even an off-the-grid house has an environmental impact, whether through harvesting wood for a woodstove or from the materials used in a solar panel. Whatever your energy source, the way you build a structure can minimize the amount of energy it uses. Window selection and installation are

both critical details. Think about where to locate windows in the house in order to get a cross-breeze, and consider how they operate so that they can be open even during rain. An awning window hinges at the top and can be placed on a wall of the house where there is



no overhang and still be open during a mild rain. Awning windows and casement windows also seal better when they are closed than a typical double-hung window. This is because their locking mechanisms hold the window tightly against the frame.

If you are factoring the sun's energy into your home's heating and cooling plans, consider your window's solar heat gain coefficient, which indicates the amount of solar

radiation that comes through the glass and warms the home. The window also may need a low emissivity coating, which essentially reflects heat. Always consider the U-value as well, which indicates how effective the glass is as an insulator. These ratings are all interconnected so it is crucial to understand what you are looking for.

These considerations might seem like minor design decisions, but carefully selected and placed windows can reduce or negate the need for air conditioning in the summer and increase comfort in the winter.

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Across the Years

Updates on Stories from The Appalachian Voice Archives

By Elizabeth E. Payne

For two decades, The Appalachian Voice has reported on environmental issues from across central and southern Appalachia. In honor of our 20th anniversary, we looked back through our archives to identify important topics that we've covered over the years and provide updates on where these issues stand today.



Mountaintop removal coal mining continues to threaten the mountains and rivers of Central Appalachia. This image of Kayford Mountain was taken in July 2014. Photo by Lynn Willis, courtesy of Appalachian Voices/Southwings

Mountaintop Removal Coal Mining's Ongoing Impact in Appalachia

In our inaugural issue in Winter 1996, The Appalachian Voice ran its first story about mountaintop coal removal mining. In "A View From Kayford Mountain: 'Seng, Ramps, And The Human Casualties of Burning Coal,'" Mary Hufford wrote about a particularly destructive form of surface mining that would grow in scope over the coming years.

In Winter 2003, we once again covered the issue when Tiffany Hartung discussed the damage already being caused by a recently permitted mine on Zeb Mountain in an article called "Mountaintop Removal by any Other Name... Elk Valley residents voice concern as cross ridge mining comes to Tennessee." For 10 years, community members and advocacy groups fought to stop this de-

struction, and in June 2013, we reported on their victory. After repeated violations to the Clean Water Act, a legal settlement ended mining on Zeb Mountain.

Mountaintop removal coal mining has destroyed more than 500 mountains and over one million acres in Central and Southern Appalachia to date. In recent years the pace of the mining has slowed, but the health risks to nearby communities remain significant. With many regional coal companies now going through bankruptcy, citizens and advocacy organizations are increasingly focused on ensuring that these sites are properly cleaned up and reclaimed.

For more on the continued threat of mountaintop removal coal mining, see the centerspread.



Hemlocks Under Threat

Hugh Irwin's article, "Exotic Pest Invasion Threatens Many Tree Species," in the Spring 1996 issue contained our first mention of the threat posed by the hemlock woolly adelgid. This non-native, aphid-like insect sucks the sap out of both the eastern and Carolina hemlocks and can damage or kill the trees within a few years.

Deborah Huso's article, "Praying for a Good Predator: Biologists introduce beetles, try to save Eastern Hemlock," in the Summer 2005 issue was one of several we've run over the years about the ongoing efforts to save the hemlock trees.

While the hemlock woolly adelgid is found across much of the eastern United

The aphid-like woolly adelgid is devastating hemlock populations in the southern Appalachians, leaving behind gray ghosts like these in the Pisgah National Forest in North Carolina. Photo by Steve Norman, courtesy of U.S. Forest Service

States, its impact in the southern Appalachians has been profound. The U.S. Forest Service is combating this pest by introducing natural predators and insecticides that kill the woolly adelgid and looking for hybrid varieties of hemlocks that are more resistant to attack.

A recent study of hemlocks in North Carolina by U.S. Forest Service scientists found that once the trees are infested, more than 85 percent are dead within seven years.



Air pollution affects the visibility at Great Smoky Mountains National Park, as evidenced by these images of clear versus hazy days. Photos courtesy of the U.S. National Park Service

A Haze Over the Great Smoky Mountains

The first issue of the publication in Winter 1996 was "partly devoted to the insidious, sometimes invisible problem of air pollution" — a topic that has been a regular theme since.

The Summer 2004 issue included a story by Matt Wasson and Harvard Ayers called "And the Winner Is... America's Most Visited Park Is Also Its Most Polluted," which covered air pollution in Great Smoky Mountains National Park. At the time it was re-

ported that, "Over the last five years, the Smokies have had more than 100 days when breathing is potentially dangerous due to excess ozone. Even healthy visitors and staff are warned to limit exertion of any kind on such days, including hiking and biking."

While ozone levels remain elevated, according to the U.S. National Park Service no ozone health advisories were issued in 2013, the latest year for which records are available.

Still Cleaning Up Coal Ash

Following the catastrophic coal ash spill in late 2008 at Tennessee Valley Authority's Kingston Fossil Plant, the February/March 2009 issue of The Appalachian Voice was devoted to this disaster that brought the problem of coal ash to national attention. We have followed the topic closely ever since.

Nearly eight years later, toxic coal ash — waste leftover from burning coal — continues to poison the region. In Alabama, communities are struggling to deal with coal ash that was transported to the area after the 2008 Kingston spill. Subsequent disasters, such as the North Carolina's Dan River



Our February/March 2009 issue focused on the disastrous coal ash spill that took place in Kingston, Tenn., on Dec. 22, 2008.

Protecting Migrating Birds

Migratory birds took center stage in "Less Twittering in the Trees: Migratory Birds Show Alarming Population Declines," an article from April/May 2009 by Kathleen McFadden that described how the loss of habitat, especially through forest fragmentation, was threatening populations of many migratory birds.

While many populations are still in decline, conservationists are hoping to reverse this trend. Appalachian Mountain Joint Ventures — a regional coalition of organizations and agencies working to conserve the habitat of migratory birds that was cited in the 2009 article — continues to partner with private landowners to protect the natural homes of at-risk birds.



The cerulean warbler's population is in steep decline. Conservationists are working to preserve its summer habitat throughout Appalachia. Photo courtesy of the U.S. Department of Agriculture

In January 2015, the coalition was awarded federal funding for a five-year program to enhance the habitat of the cerulean warbler. This program includes funding to manage and improve 12,500 acres of forest land and 1,000 acres of reclaimed mine land in West Virginia, Pennsylvania, Kentucky, Ohio and Maryland.

Battle to Save Blair Mountain

The largest labor uprising in American history took place in late August and early September, 1921, on Blair Mountain in southern West Virginia. At that time, thousands of miners joined forces to fight for better treatment and the right to unionize.

In the Summer 2005 issue, Denise Giardina wrote an article called "The Battle of Blair Mountain... Revisited" about the ongoing struggle to save the archaeological remains of the battle from destruction by mountaintop removal coal mining.

After years of victories and defeats for conservationists, for now it seems



In June 2011, environmental activists gathered for the March on Blair Mountain in an effort to save the historic site from destruction from mountaintop removal coal mining.

the site will be preserved. On July 26, 2016, the U.S. Department of the Interior dropped its appeal of an earlier case, paving the way for the site to be returned the National Register of Historic Places, which will add some protection to the battlefield.

Passing on the Pipelines

The expansion of natural gas pipelines into the Appalachian region was first mentioned in the Late Summer 2003 issue. In "Passing on the Patriot Pipeline: Duke Power Criss-Crossing New River Watershed," Lynn Caldwell and Jeffrey Scott wrote of their fight to block a pipeline already under construction.

By the next year, the Patriot Extension was fully operational. The 95-mile pipeline is now operated by Spectra Energy, a spin-off company of Duke Energy, and extends from one natural gas pipeline in Wythe County, Va., to another pipeline in Rockingham County, N.C.

Since then, natural gas infrastructure has expanded across Appalachia, and so has our coverage. Today, community members and environmental groups, including Appalachian Voices, are fighting to block



The East Coast is crossed by natural gas pipelines. Blue indicates existing pipelines, other colors are proposed pipelines. Map by Dominion Pipeline Monitoring Coalition. On July 23, more than 600 people gathered in Richmond, Va., for the "March on the Mansion" to ask Gov. Terry McAuliffe to stand against proposed pipelines in the state (right).



the construction of two more proposed lines — the Mountain Valley and the Atlantic Coast Pipelines, in Virginia, West Virginia and North Carolina. For the latest, see page 20. ♦

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Navigating the Russell Fork

Poised to bolster a flagging economy, one river also faces threats from coal mining

By Erin Savage

The Russell Fork River, with its steep gorge walls, impressive rapids and tranquil pools, is one of the best-known and most-visited rivers in Central Appalachia.

Like many waterways in the region, human activity has impacted the Russell Fork for well over a hundred years. At times, coal mining has had a significant impact, but so too have natural gas drilling, construction, sewage and trash dumping. In general, the Russell Fork's water quality has improved over the last few decades, due to efforts by local residents and stronger regulations from state and federal governments.

Despite better water quality, the Russell Fork faces new threats from potential coal mining. Last year, Appalachian Voices, the publisher of this newspaper, submitted an application to the national river advocacy group American Rivers asking that the Russell Fork River be included in their 2016 list of America's Most Endangered Rivers. In April, the annual list — which highlights 10 at-risk waterways — was announced and the Russell Fork was included and ranked at No. 7.

The river's listing was due to a proposed surface mine in the Russell Fork headwaters known as the Doe Branch Mine. A portion of the current mine proposal was approved back in 2005, but the mine's future remains unclear, as do its impacts on the Russell Fork watershed. At a time when the coal industry has seen massive declines and the region is grappling with an uncertain future, opinions regarding the mine vary widely.

More Than Just a River

Part of the Big Sandy River Basin, the Russell Fork begins in Dickenson County, Va., and flows north into Pike County, Ky.



In the image across the top, kayakers gather at the finish of the Lord of the Fork Race. Photo by Gareth Tate. The Russell Fork River is the main attraction of Breaks Interstate Park, above.

It is the main attraction at Breaks Interstate Park, which spans the border between the two states. In the park, the river forms one of the deepest gorges east of the Mississippi and is home to the Big Sandy crayfish, which is listed as "threatened" by the U.S. Fish and Wildlife Service.

In an area challenged by the economic realities of a declining coal industry, the Russell Fork and Breaks Interstate Park provide a welcome economic boost for the region. In 2015 alone, visitation to Breaks Interstate Park generated \$9.95 million in economic impact.

The 52-mile waterway boasts many recreational opportunities, including fishing, swimming and paddling. The Army Corps of Engineers controls the Flannigan Dam, a flood control dam upstream of the sections most commonly used for rafting and kayaking. In the fall, the reservoir is drawn down, creating predictable weekend flows throughout October. These recreational releases attract intermediate and advanced paddlers from around the country. An annual experts-only race through the gorge at the end of October, the Lord of the Fork Race, includes local

and international competitors.

Other regional tourism efforts also contribute to new economic impacts in the region. The annual Cloudsplitter ultrarunning race, which travels beside a portion of the Russell Fork and ends in Elkhorn City, Ky., generated \$25,000 in new economic impact in 2015 alone, according to a study by Eastern Kentucky University. Other groups in the region are working with the Army Corps of Engineers and their congressional representatives to potentially increase the number of recreational releases from Flannigan Dam.

The Russell Fork has a dedicated following, including local residents and others from surrounding areas in Kentucky and Virginia. For over a decade, the Friends of the Russell Fork, a small but determined group of community members in and around Haysi, Va., have worked to improve the quality of the watershed and promote the river as a vital cultural and economic resource for the area.

Under the leadership of Director Gene Counts, a local kayaker and retired public school administrator, Friends of the Russell Fork has worked with other local leaders, school children and visiting AmeriCorps volunteers to clean illegal dump sites and monitor tributary streams for pollution. The organization has provided steady leadership in advancing sustainable environmental practices throughout the watershed.

"We work with schools within the watershed, teaching students how to monitor the health of our watershed through hands-on microinvertebrate studies," says Counts. "I believe engaging young people in our home towns is key to maintaining the health of the Russell Fork."

In 2011, the organization surveyed more than 200 homes along Russell Fork tributaries for sewage straight pipes and faulty septic systems, providing critical information to state agencies with resources to upgrade the

communities' sewage systems.

The river obtains some additional protections through state and federal programs. In 2010 the state of Virginia designated the Russell Fork a Virginia Scenic River. While the designation does not specifically limit human activity in the river corridor, it does help to increase the influence of local residents' voices in decisions that may impact the river.

The federal Clean Water Act has also led to improvements in water quality for the Russell Fork and its tributaries through more protective regulations and additional monitoring requirements. The law also requires that states keep a list of impaired waterways and develop pollution management plans for these areas. In 1996, Virginia added Russell Prater Creek, a Russell Fork tributary, to the state's list. The creek was listed due to its diminished ability to support aquatic life. The state identified two types of pollutants, total suspended solids and total dissolved solids, as the most probable stressors (see information box on page 14).

In 2006, the state of Virginia proposed — and the U.S. Environmental Protection Agency approved — a pollution budget, known as a total maximum daily load, for Russell Prater Creek. At that time, there were at least 35 mining facilities discharging pollutants into the tributary. The state identified mining as a major contributor to the creek's poor health, and developed plans for reducing pollution in the watershed. However, the most recent monitoring data from 2014 and 2015 indicate that the watershed is still exceeding its allowed total dissolved solids wasteload by 1,076,907 kilograms per year — more



Map by Jimmy Davidson/Appalachian Voices

Endangered Appalachian Rivers

By Elizabeth E. Payne

Since 1984, the national conservation group American Rivers has worked with grassroots conservationists to bring attention to 10 of the nation's most threatened rivers by compiling the annual America's Most Endangered Rivers list. To be included

in the list, the river must face risks and have a "major decision (that the public can help influence) in the coming year." Over the years, the list has included several Appalachian rivers. Below are updates on how some of the decisions facing these waterways were resolved. For more information and to view past reports, visit americanrivers.org/about-mer/

Coal River — West Virginia

Named No. 9 out of 10 in America's Most Endangered Rivers of 2012 because "the devastating practices of mountaintop removal mining and valley fills that bury and poison headwater streams pose a dire threat to the health of the Coal River and surrounding communities."

A 2011 decision by the U.S. Environmen-

tal Protection Agency to block the permit for the Spruce No. 1 mine, the largest potential mountaintop removal site threatening the Coal River watershed, was mired in legal challenges when the river was included in the list. But in July 2016, a U.S. Court of Appeals upheld the original decision to not issue a permit for the site.



Coal River at Upper Falls. Photo courtesy of National Weather Service



Gauley River near Summersville Dam. Photo by Ken Thomas / Wikimedia Commons

Gauley River — West Virginia

This 107-mile river is famous among white-water enthusiasts, particularly for its class IV and V rapids that result from the annual opening of the Summersville Dam floodgates. It was named No. 3 out of 10 in America's Most Endangered Rivers of 2010 because it "is scarred by coal mining impacts and subjected to degradation from ongoing mining activity."

The listing highlighted the need for more stringent water quality regulations, particularly

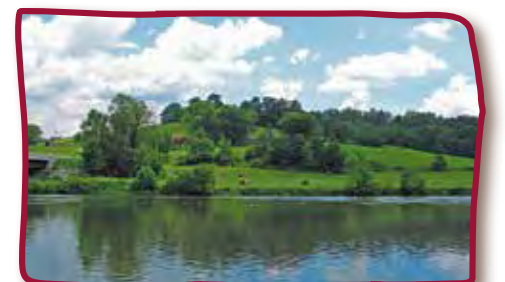
for conductivity and the pollutant selenium. Conductivity measures the ability of water to pass an electrical current and is used to gauge the presence of pollutants dissolved in the water. In 2010, the U.S. Environmental Protection Agency issued a conductivity guidance, which was delayed by legal battles, but is now in effect. In 2016, the EPA finalized a new criterion for selenium. Read more on page 21.

Holston River — Tennessee

For 274 miles, this river flows from Southwest Virginia into Tennessee where it joins the French Broad River to form the mighty Tennessee River. It was named No. 3 out of 10 in America's Most Endangered Rivers of 2015 because "the river and its communities are threatened by an army ammunition plant that has been contaminating water supplies with toxic chemical pollution for years."

On Sept. 28, 2015, Tennessee Clean Water Network, the U.S. Department of Defense, and BAE Systems Ordnance Systems, Inc., the contractor that operates the Holston Army Ammunition Plant, reached an agreement to reduce the amount of RDX discharged in the river by 2020. RDX is the toxic and explosive chemical causing the pollution.

For news about the plant's air pollution permit, see page 4.



Holston River in Surgoinsville. Photo by Brian Stansberry / Wikimedia Commons



Great Falls on the Potomac River. Photo courtesy of the National Park Service

Potomac River — Virginia

The majestic Potomac flows for 380 miles from West Virginia through Virginia and Washington, D.C., before emptying into the Chesapeake Bay. It was named No. 1 out of 10 in America's Most Endangered Rivers of 2012 because of agricultural and urban pollution and the threat of congressional rollbacks to the Clean Water Act.

The passage of the 2015 Clean Water

Rule clarified which bodies of water are covered under the Clean Water Act in response to challenges in the courts, although congressional efforts to roll back the legislation continue. The main threat facing the Potomac River today is contamination from coal ash impoundments at Dominion Virginia Power's Possum Point Power Station, according to Dean Naujoks, the Potomac Riverkeeper.

continued on next page

Russell Fork

continued from previous page

than twice the target limit established by the state.

The Doe Branch Mine

The Doe Branch mine, as currently proposed, would be one of the newest and largest mines in the Russell Fork headwaters. It began as a plan submitted by Paramount Coal for a 245-acre permit in 2005. At that time, Paramount was owned by Alpha Natural Resources, which was one of the largest coal companies in Central Appalachia and in the country. The mine was also slated to be part of a large highway construction project known as the Coalfields Expressway.

The Coalfields Expressway was originally designed in 2001 as a highway to link U.S. Route 23 in Virginia to Interstates 77 and 64 in West Virginia. Early construction plans were hampered by steep terrain and associated high costs. In 2006, the Virginia Department of Transportation began working with Alpha Natural Resources and another coal company, Pioneer Group, to explore an option where surface coal mines would provide the first steps in constructing the roadbed. The new plan significantly changed the route of the highway so that key mines could be worked into the project, including the Doe Branch mine.

The highway project is controversial — supporters claim it would bring much-needed economic development opportunities to the region, but those op-

posed to the plan feel it unnecessarily enables additional surface mining and does not adequately consider what is best for nearby communities.

“Road construction in the area could benefit the region, at least through short-term employment, and could motivate new industries to move to the region, but only if the project is well thought out and economically viable,” says Matt Hepler of Southern Appalachian Mountain Stewards.

Both Appalachian Voices and Southern Appalachian Mountain Stewards oppose the Coalfields Expressway, as the plan currently stands, due to its reliance on surface mining.

Plans for the Doe Branch Mine and the highway have progressed slowly — as of the last state inspection in June 2016, no mining activity had started and no wastewater was being released, though there had been some logging. In 2012, Paramount applied for a permit modification that would expand the mine by an additional 860 acres. The update would increase the total size of the mine to approximately 1,100 acres, fill four additional valleys with excess rock and dirt, and increase the number of wastewater discharge points from three to 14. Five of the new wastewater discharge points would release into Doe Branch and Wolfpen Branch, which feed into Russell Prater Creek, the Russell Fork tributary already impaired by mining-related pollutants.

That same year, the U.S. Environmental Protection Agency issued an objection to the company’s request to expand the Doe Branch Mine. The EPA’s objection cited inadequate wastewater permit limits and water quality remediation plans, including the fact that the state did not impose numeric limits on the amount of dissolved solids that could be discharged from the mine’s wastewater outfalls.

The company’s 2011 plan included the construction of 16 wetlands to theoretically reduce both total dissolved solids and total suspended solids in the watershed. However, the EPA stated in its objection that wetlands won’t solve the problem. “We also are unaware of any generally accepted, peer-reviewed literature identifying any geochemical process through which wetlands would remove dissolved, as opposed to suspended solids,” regulators wrote. The agency’s objections still stand in 2016.



Andria Davis runs a Russell Fork rapid during a release of the Flannigan Dam. Photo by Leland Davis

Current Developments

In August 2015, Alpha Natural Resources filed for Chapter 11 bankruptcy. The bankruptcy was expected and came in a long line of similar bankruptcies filed by other coal mining companies over the last several years. The change slowed but did not halt plans for the Doe Branch Mine.

Alpha’s plan for emergence from bankruptcy was approved by the court in the summer of 2016. The plan involves the formation of two new companies. One is a privately held, smaller Alpha, which will retain most of the Central Appalachian coal mines. The other is Contura Energy, formed by Alpha’s senior lenders, which purchased Alpha’s Wyoming, Pennsylvania and better-performing Central Appalachian mines. Doe Branch is included in the short list of Central Appalachian mines that Contura now owns.

Though Alpha stated earlier this year that its 10-year plan did not include pursuing the Doe Branch Mine, the change in ownership may indicate otherwise. “When Alpha split in two in order to emerge from bankruptcy, it conspicuously loaded all of its valuable assets into Contura, and left the reorganized Alpha with high-liability assets needing to be wound down and reclaimed,” says Sierra Club Staff Attorney Peter Morgan. “Because the Doe Branch Mine went to Contura, it appears clear that the company sees value in the mine and hopes to continue developing it.”

In August 2016, a new draft water pollution permit was published by the Virginia Division of Mine Land Reclamation, for the mining operator now known as Paramount Contura, LLC. The new draft permit still does not impose numeric limits on the amount of dissolved solids that can be discharged from the Doe Branch Mine.

The following month, the EPA notified the state of a general objection to the new draft permit, because the 2012 specific objection regarding the amount of dissolved solids the mine would generate had not yet been resolved. Though the EPA will review the new draft to determine if it resolves the issues raised in 2012, given the lack of changes, it seems likely that they will continue to object. But if Paramount can address the EPA’s concerns, the company could secure the last remaining permit it needs in order to move forward.

International prices for coal have increased recently, driven by demand for steel-making coal in China, which could increase production in Central Appalachia. The construction of the Coalfields Expressway could also shift the economic calculations in favor of moving forward. The plan not only makes road construction cheaper, but also decreases the costs of permitting and reclamation for Paramount.

Environmental groups and concerned citizens are continuing to track the progress of the Doe Branch Mine. Even if the mine moves forward, it is likely that increased oversight from these stakeholders could lead to more stringent and protective permit requirements.

Though the coal-bearing mountains on either side of the Russell Fork are part of what places it at risk, the river’s stunning surroundings are also a reason for optimism. Between decades of local stewardship and growing national concern for this Appalachian treasure, there is a community of advocates watching out for the Russell Fork. ♦

Learn more and take action at americanrivers.org/2016-russell-fork

Celebrating with the Affrilachian Poets 25 Years of “Making the Invisible Visible”

By Forrest Gray Yerman

“We are African Americans in Appalachia — Affrilachia,” says fantasy novelist and poet Gerald Coleman in an interview on the Carnegie Center for Literacy and Learning’s website. “And so,” he continues, “we knew kind of intimately and in a nebulous kind of way who and what we were, but by putting a name to it that kind of solidified it, that formalized it. This is who we are.”

Frank X Walker — the 2013-2014 Kentucky Poet Laureate, 2014 NAACP Image Award winner and author of seven poetry collections — was integral to the emergence of the Affrilachian Poets. In 1991, after reading a dictionary definition of “Appalachian” as “a white native or resident of the Appalachian mountain area,” Walker created the word “Affrilachia” to acknowledge his experience in the region.

During this time, he and a group of friends at the University of Kentucky in Lexington began calling themselves the Affrilachian Poets. After many years of growth and accomplishments, the group is celebrating its 25th anniversary with poetry readings, book publications, road trips and rounds of golf across the region and country.

The word “Affrilachia” is now defined in the Encyclopedia of Appalachia and the New Oxford American Dictionary as acknowledging the historical and contemporary presence



Frank X Walker is a native of Danville, Ky., where he read from his poetry at the Governor’s School of the Arts. Photos by Patrick Mitchell

of black people in Appalachia. For many in the Affrilachian Poets, the term makes room for more ways of understanding and naming one’s Appalachian identity.

“I don’t think there’s a singular Affrilachian identity, per se,” says Bianca Spriggs, a multi-disciplinary artist and author of five poetry collections. “But I think what it does is it ... opens the door for a spectrum of identities to be welcome.”

Indeed, Marta Maria Miranda, president of The Center for Women and Families in Louisville, called herself in pluck! The Journal of Affrilachian Arts & Culture, “Cubalachian — Cuban by birth and Appalachian by the grace of God.”

In looking at the majority of the group, however, the Affrilachian Poets are similar to the writers of the Harlem



Renaissance and Black Arts Movement — a predominantly black group of writers.

“Replacing those ‘p’s’ with ‘f’s’ says you are not invisible,” Crystal Wilkinson, author of two short story collections and a novel, said of the word “Affrilachia” in an interview with the Appalachian Journal. “That I was part of something that has such a longevity and such an impact is phenomenal. The poets tour all over the country and the idea that this word Affrilachian is floating around helps combat some of the stereotypes about us. I think that is wonderful.”

Collectively, the group’s 40-plus members have published more than 60 books, including poetry collections, short stories, novels, memoirs, plays, and, most recently, a coloring book. The books range across a spectrum of literary genres and topics. The members have also published widely in literature anthologies and journals such as pluck!, which, in all 13 issues, features work from most of the Affrilachian Poets.

One sign that the group has gained the respect of Appalachia’s literary communities is their presence in many regional anthologies as well as special journal issues dedicated to Frank X Walker. Many Affrilachian Poets have also been published in anthologies of African American

literature, including two poems by the late Norman Jordan — long before the group formed — published in the 1970 anthology “The Poetry of the Negro.”

A commitment to education can be seen in the Affrilachian Poets’ presence in universities across the country. Members of the group lead writing workshops with Cave Canem and the Hindman Settlement School, and have taught writing classes in prisons. Walker, who is often referred to as “Professor X,” has received honorary degrees from the University of Kentucky and Transylvania University.

Joy Priest, an up-and-coming poet and masters of fine arts candidate at the University of South Carolina, described the role of activism in her writing. “Oh, that’s major. I would refer to the Affrilachian Poets as activists,” she says. “All of our work is activism by nature, because that’s what making the invisible visible is all about.”

Poets Amanda Johnston and Crystal Good represent the group’s dedication to social activism. Johnston does so in her hashtag poetry and letter writing campaign, #BlackPoetsSpeakOut. And Good serves as the “Social Media Senator for the Digital District of West Virginia,” a position she created to help relay the sentiments expressed by the state’s social media users to political representatives.

If their past and present indicate the future of the Affrilachian Poets, they can be expected to live long and prosper as artists, educators, and activists across the Appalachian region and beyond.

“I would love to do an international tour, and I’d love to have an Affrilachian Press,” Bianca Spriggs says. “Frank would probably say he could see a spaceship with Affrilachia written on the side.” ♦

To learn more visit theaffrilachianpoets.com, coalblackvoices.com

Forrest Gray Yerman, a native of Matney, N.C., received an M.A. in Appalachian Studies from Appalachian State University. He recently moved to Lexington, Ky., and is currently applying to doctoral English programs to further study and understand the Affrilachian literary movement.

Identifying Pollutants

Total Dissolved Solids: substances dissolved in water, including minerals, metals and salts. Common sources include sewage, road salt used in the winter, and heavy metals and minerals exposed through mining and dissolved by rain.

Total Suspended Solids: small solid material floating in the water, such as sediment, plant material and sewage. Common sources include sewage, and debris from construction, logging and mining.

Total Maximum Daily Load: A TMDL is a pollution budget and management plan developed by states for streams and rivers that do not meet water quality standards. The TMDL identifies which pollutants are causing stream impairment and calculates the maximum amount of each pollutant that a waterway should be able to handle while still meeting water quality standards.



Affrilachian Poets at the 25th Anniversary Reading at the Governor’s School of Arts, in Danville, Ky. Top, left to right: Asha French, Makalani Bandele, Bianca Spriggs, Keith Wilson, Mitchell L.H. Douglas and Frank X Walker. Bottom, left to right: Gerald Coleman, Shayla Lawson, Kelly Norman Ellis, Joy Priest and Bernard Clay. Photo by Patrick Mitchell

Fostering Climate Resilience Adaptations in Changing Times

By Eliza Laubach

Ancient air bubbles trapped in ice provide a history of the atmosphere from as far back as 400,000 years ago, and tell the story of a new geologic time emerging. The earth's atmosphere now contains more carbon dioxide than it ever did in these ancient samples, according to NASA, namely because of the potent greenhouse gases released from burning fossil fuels.

This past April, 180 countries signed the Paris climate agreement, which lays out a strategy to keep global temperatures from rising more than two degrees Celsius above the pre-industrial average. In 2015, the Obama Administration released the Clean Power Plan, an unprecedented effort to curb carbon dioxide emissions from power plants in the United States. As of July, global temperatures are 1.03 degrees Celsius above the historic baseline, according to the National Oceanic and Atmospheric Administration National Centers for Environmental Information.

Warming temperatures, driven by changes in global atmospheric circulation, are breaking records in the Southeastern U.S. The most recent decade — 2001 to 2010 — was the warmest on record, and in the past three decades the Southeast has experienced more extreme climate and weather disasters than any other region of the United States, according to a Southeast Regional Climate Assessment report. But when it comes to predicting the impacts of global climate change in Appalachia, Virginia State Climatologist Jerry Stenger laughs at the mystery presented by the complex terrain.

Appalachia's mountain ranges run erratically and often surround valleys, which creates uniquely dry microclimates. Stenger explains that high mountain peaks can also lock thunderstorms in an area, releasing large amounts of rainfall and causing flash flooding. Individual storms cannot be directly linked to climate change. But strong rain events, like the one that led to devastating flooding in West Virginia earlier this year, may well become more frequent, says Stenger, and their effects are intensified by mountainous topography.

The mountains' unique weather patterns make it challenging to predict how global scale warming will affect the region. According to Stenger, while much of Appalachia will see warming, some areas will see cooling or no change at all. "There's so many uncertainties, but that's the nature of it," he says.

Gauging Impacts on Ecosystems

Appalachia's biodiverse ecosystems harbor species that thrive in its lush, wet forests and provide the region with ecological resilience, a term that refers to a system's ability to absorb impacts before changing state altogether. But warming is resulting in longer growing seasons and is leading some plants to climb in elevation or move northward. Some rare and important species are at risk from a more unpredictable climate, such as the spruce-fir forests on the tallest mountain



A little shack, above, houses an automated device that measures stream flow every five minutes to assess water levels. Photo by Judy Schoonmaker. At right, Chris Oishi discusses his research in "The Electric Forest." Photo by Karl Bates.



peaks, the region's uncommonly abundant species of salamanders or the prized brook trout.

Even in southern Appalachia, which boasts a rainforest reputation, the U.S. Drought Monitor shows precipitation was below average across most of the region this year. All over the Southeast, droughts are becoming more common and severe, impacting municipal drinking water supplies, many of which are reservoirs fed by watersheds flowing from private or federally owned forest.

At the Coweeta Hydrologic Laboratory in southwestern North Carolina — a nearly 5,000-acre forest designated for experimental research in 1934 — U.S. Forest Service scientists track stream flow within a watershed to better understand how forest changes affect reservoirs. They also monitor climate and forest changes at places like the so-called "Electric Forest," a section where trees are rigged with monitoring devices to assess their water uptake. Advanced meteorological tools measure the amount of carbon dioxide cycling through the trees and the atmosphere.

In his research at Coweeta, Chris Oishi has found that southern Appalachian forests absorb more carbon dioxide from the atmosphere than originally thought. He discovered that the Electric Forest takes carbon dioxide from the atmosphere and stores it in the soil and plant material, ultimately absorbing more carbon than it generates through decomposing trees or disturbed soil — resulting in what is known as a carbon sink. At Coweeta, about 1.1 tons of carbon are sequestered per acre of forest per year, roughly as much carbon dioxide as the emissions of

one average car.

Oishi and his colleagues have also found that climate change is lessening the carbon sink potential of forests as warmer, drier years lessen the trees' ability to absorb carbon. Species transition within an ecosystem also plays a factor. In one example Oishi noted, as the carbon-absorbing hemlock dies out across Appalachia and is replaced by rhododendron, carbon sinks are diminished.

Forested land would need to increase in size in the Southeast in order to keep up with rising carbon dioxide emissions, says Oishi.

One group working to maintain the Southeast's forest carbon sinks is the Dogwood Alliance, a conservation advocacy group based in Asheville, N.C. The organization's Carbon Canopy program is working to create a market for the region's carbon sinks, providing private landowners and corporate partners with financial incentives to help preserve large tracts of forested land.

Climate change has the potential to increase a forest's vulnerability to drought. According to Oishi, the dominant species in southern Appalachian forests is shifting from oak and hickory to tulip poplar and maple, most likely due to fire suppression and climate change. These types of trees use more water, lessening streamflow and water supply. Since record keeping began in 1936 at Coweeta, 80 percent of the severe drought cycles have occurred between 1980 and the present.

During a drought, the forest system becomes stressed when trees and plants compete for water. Higher-elevation

continued on next page

Climate Resilience

continued from previous page

hardwood coves host valuable medicinal plants that are especially vulnerable to water scarcity. Some species can be killed off in as little as one season, as opposed to trees, which take several years to die from drought.

Joe-Ann McCoy, director of the North Carolina Arboretum's Germplasm Repository in Asheville, N.C., works to save the seeds of these important plants, such as black cohosh and ginseng. The seed bank at the arboretum is one of the only ones in the country focusing on native medicinal plants. McCoy is looking for varieties resistant to climate change and focusing on projects with people who have longstanding relationships with these plants.

According to McCoy, seed banks are vitally important for helping people adapt to climate change. For the past seven years, McCoy has been partnering with the Eastern Band of Cherokee Indians on seed saving. Like all tribes in the Southeast, the Cherokee do not have any seed banks. But McCoy is hoping to change this. In collaboration with the United South and Eastern Tribes, Inc., and the Bureau of Indian Affairs, she is helping to establish a program to create seed banks of traditional native and heirloom plants for 26 indigenous tribes.

"We should have already done this 10 years ago," McCoy says. "Europe is way ahead of us on this."

Seeding Climate Justice

As social justice and environmental issues more visibly intersect, a solutions-based effort is emerging — climate justice.



During canvassing, SEED invites the community to an energy efficiency workshop, above. At right a participant is congratulated on completion of a program. Photos courtesy of SEED.

People who are vulnerable to social and economic challenges are also susceptible to being directly impacted by climate change, such as having fewer resources to rebuild after severe weather events. People in low-income communities are more likely to be impacted by the fossil fuels that cause climate change — such as people who live near power plants. Climate justice aims to address all of these issues at once.

Stan Johnson, co-founder of Socially Equal Energy Efficient Development in Knoxville, Tenn., teaches city residents about shifts they can make to lessen their impact on the climate while also empowering youth from the city's low-income neighborhoods.

SEED designed its program to reflect two community concerns: high energy bills and the lack of local, high-paying jobs. Participants in this program are trained in career readiness and complete door-to-door neighborhood education about energy efficiency. SEED also received a grant for recycling education.

According to Johnson, the organization's expertise is reaching people in the community who are not reached by tra-



ditional media pathways. "We don't want it to be just the eco-elite with the solar panels and hybrid cars," he says. "Bring it down to the everyday person — what they can do."

Tom Rodd, initiative director of Allegheny Highlands Climate Change Impacts Initiative sees climate change and social justice issues intersecting in low-income communities that are polluted by coal mines. Rodd has educated residents, held conferences, and published reports about climate impacts in Central Appalachia.

West Virginia's economy is built on fossil fuels including coal, says Rodd, and talking about climate change can be very difficult for people who have mined and extracted these resources for generations. "Nobody told them they were at risk of losing their jobs because of the tiny molecule CO2 that has the potential of destroying the planet," he says.

Part of the solution, he says, is to financially support these communities and fight for a more just transition away from a fossil-fuel dependent economy. He speaks in broad terms about what is at stake: the loss of fish habitats and forests, and increased flooding and more frequent heat waves. He has had the

most success with teachers and students, the least success with politicians. In West Virginia, he says, "it's an adjustment process for everybody."

Allegheny Highlands is now focusing primarily on climate change education for teachers. Rodd's generation helped create the problem, he says, but it will be up to the next generation to fix it.

To avert climate chaos, Jodi Lasseter, founder and co-convenor of the North Carolina Climate Justice Summit, encourages a culture shift achieved by developing authentic relationships across differences, such as race, age and gender. The summit, in its third year, unites high school students, community organizers and nonprofit changemakers from across the state. The groups learn from and inspire each other to "reform, resist, reimagine and re-create the societal systems that constructed fossil fuel-induced climate change," says Lasseter.

The event, held in Browns Summit, N.C., gives attention to those who are directly impacted by fossil fuels. Last year, a member of Walnut Cove, N.C., which is polluted by coal ash, participated in a frontline community panel.

With the increasing threat of climate change, ecological resilience is important for Appalachia's biologically sensitive areas. The ability of the region to develop solutions relies on the strength of its scientific and grassroots communities. According to Lasseter, it's critical that those who are not on the front lines of climate impact stand in solidarity.

"We want to reclaim our people power to take collective action," she says. ♦



Joe-Ann McCoy saves seeds and collects data on sochan, an edible coneflower native to Southern Appalachia and part of Cherokee cuisine. Photo courtesy of Joe-Ann McCoy.

2016 State Legislatures on Climate Change

North Carolina: This year saw the sunset of a state tax credit for renewable energy, and state regulators rejected a petition that would have increased access to solar power by allowing companies other than Duke Energy to finance solar panel installations.

Virginia: Although the legislature blocked the Clean Power Plan's implementation in the state, the governor issued an executive order for state agencies to develop carbon reduction strategies by spring 2017.

West Virginia: The legislature defeated an effort to repeal the state's adoption of national science education standards that include climate change, but adopted cur-

riculum changes that downplay the link between climate change and human causes.

Kentucky: A new law establishes a prescribed fire burn program set to begin by summer 2017. Prescribed burns imitate historical forest management and diminish wildfire risk, which is increasing with climate change, according to USFS scientists.

Tennessee: Under a new law, farmers now have greater protection to open Confined Animal Feeding Operations, or CAFOs, even if they are deemed a public or private nuisance. These massive livestock operations are significant sources of methane, a potent greenhouse gas.

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#Appalachia

Technology, Community and Industry in the Silicon Holler

By Donald Welch

In Wise, Va., Lincoln Road Coffee, an independent, family-owned company, holds regular media meetings to discuss how their hashtags #LincolnRoadCoffee and #FriendsofLincolnRoad are being used on social media and to set a budget for Facebook advertising.

"We use #Appalachia because we always want to tell people where we're from," says Ryan Jones of Lincoln Road Coffee. This web-focused approach has not only helped the small business grow in their immediate market, but their unique cold brew is now distributed across the country with orders from states like Texas and Washington.

While these marketing strategies may sound more in line with a business in a metropolitan tech hub like New York or San Francisco, Lincoln Road Coffee is in a small town in the mountainous southwestern corner of Virginia.

In West Virginia, only 57 percent of the state has broadband coverage, and of that less than 2 percent has access to fiber-optic broadband. And in nearby Kentucky, broadband coverage extends to 65 percent of the population, with fiber accessible to 10.6 percent of those broadband users. Lawmakers, nonprofits, historians and activists in both states are working to bring fiber-optic broadband into their communities. In doing so, they're hoping to reshape the economic and social geography of Central Appalachia.

Building a Broadband Highway in West Virginia

According to West Virginia State Senator Chris Walters, technology is a

crucial part of the 21st century economy.

To this end, Walters sponsored S.B. 315, known as the Middle Mile Bill, which aims to create fiber-optic lines that connect the rural areas of the state. To fund this effort, the bill requires state agencies to seek federal grants and requires the water development authority to pursue performance bonds. Walters doesn't want West Virginians to pay for the construction of the fiber line.

According to Walters, the state's inconsistent internet adversely affects its students, especially young adults who are trying to take advantage of online colleges to finish degrees. Incidents such as an internet connection failing in the middle of a test or important lecture could cause students to fall behind. Irregular access to efficient broadband across the state, Walters says, violates a 1982 court decision mandating that West Virginia provide an equal educational opportunity to all students.

Walters explains that the state can "build a 2500-mile fiber optic interstate for \$78 million, but two miles of regular [road] interstate costs \$80 million." Once a fiber network is built, internet service providers would pay a rental fee to use the West Virginia "middle mile" fiber lines to reach the "last mile" rural clients. Walters hopes this will encourage competition between multiple providers — currently, Frontier Communication controls



Green Bank, W.Va., resident Alfred Ervine watches a technician hook up his new internet and television service in 2014. Photo by David Kidd / Governing

what little fiber links rural West Virginia.

The concept of a "middle mile" fiber line sponsored through the state isn't foreign to Appalachia. Kentucky has created a public-private partnership called KentuckyWired that, according to its website, will build "a statewide, open-access fiber optic network which will deliver robust, reliable and affordable Internet to communities across the state through broadband technology."

A September statement from the governor's office noted that the KentuckyWired middle-mile network is slated to include more than 3,000 miles of fiber optic cable and use more than 1,000 government and post-secondary education sites as jumping-off points for local internet service providers to use to connect to "last mile" rural customers. "Preparation work has already taken place at nearly 100 government, university and community college sites in eastern and northern Kentucky," according to the statement. The statement also details a partnership with Eastern Kentucky Network, LLC, which aims to extend 305 miles of fiber to 21 counties and 20 communities in Eastern Kentucky.

In Eastern Kentucky, broadband expansion has helped spur the creation of new companies such as BitSource in Pikeville, Ky., a digital design company started by people who previously worked in the coal industry.

To help local workers retrain for technology jobs, the regional arts organi-

zation Appalshop developed the Mines to Minds initiative. Run in partnership with Southeast Kentucky Community and Technical College, the program will offer technology certificates and is slated to begin in the spring 2017 semester. Mines to Minds will focus on two main tracks for certification: digital design and system administration. These tracks will encompass software writing, coding, website development and security — all examples of local need, according to Shawn Lind, Appalshop's coordinator for the project.

Lind spoke with area employers about their technology needs and then devised a series of classes that would train students to fill technology positions and meet the needs of those local companies. "We aren't trying to recreate the wheel that Southeast is already doing," Lind said in an email, "just improve it a bit."

The Mines to Minds program will also use the digital classroom at Appalshop's facility in Whitesburg, Ky. "We will be organizing and hosting free community workshops on many different technology tools," Lind explains. "It might be teaching photography skills for local businesses to take better photographs of their products/services. It might be a workshop for area organizations to make more effective social media posts incorporating new multimedia content."

As better broadband continues to bring technology jobs into Eastern Kentucky, Lind says he hopes the program

continued on next page

#Appalachia

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will "develop a high tech workforce so local people can find local jobs."

However, it's not just local nonprofits working to fill emerging technology jobs. In June, the federal government announced the expansion of their TechHire initiative into Southwest Virginia and Western North Carolina.

TechHire, which is already active in Eastern Kentucky, is an Obama administration program that works in targeted communities to train workers in technology fields and help them find local employment. The program also aims to showcase how interconnected technology is with other industries, since even manufacturing plants need an IT department. In doing so, TechHire focuses on specific regions and their particular needs.

"About 300 jobs have been created since TechHire launched in eastern Kentucky in 2015, with an estimated \$6 million impact on the local economy," a June White House blog reports.

Following this initial success in Eastern Kentucky, the White House blog states that the new South Central Appalachia TechHire program "will prepare and place over 50 individuals into tech jobs over the next year, and 400 by 2020."

Social Media in Appalachia

While State Sen. Walters and others throughout the region work on changing the policies surrounding broadband, other organizations are looking to the community. Michael Parsons and Eric Meadows run Voices of Appalachia, a website and social media outlet based out of Charleston, W.Va., that, as Parsons explains, "aims to promote a positive story of Appalachia by preserving modern heritage and culture." In sharing archival photos, stories and bits of regional history through social media, Meadows argues that, "you can be culturally true to your ancestors and still exist in modern society."

According to Meadows, starting this past February they invited followers on their Facebook page to comment on the archival and historical photos Voices of Appalachia uploaded, asking if anyone had similar memories. Many of their

followers with stories or experiences wrote comments and shared the page with their friends and family. Meadows states that these interactions expanded Voices of Appalachia's Facebook followers from 3,000 in February 2016 to over 15,000 followers as of September.

Both Meadows and Parsons agree that West Virginia needs to ensure that internet is accessible to everyone in the state. They see the Middle Mile Bill proposed by Walters as a step in that direction.

Despite running such a successful site, Meadows doesn't have home broadband. Instead, a job in technology allows him the means for an expensive and reliable satellite connection that many can't afford. With "access to quality reliable internet" Meadows notes that there's potential to revitalize mining towns by turning mine and mine-related buildings that have closed into technology centers for the community, in much the same way cities are repurposing factories and warehouses. "Lets make these tech centers, community centers," he says, explaining that such transformations will foster economic diversity.

Parsons points out that even with initiatives such as Sen. Walters' Middle Mile Bill, Appalachia needs to "start working on opportunities to keep young people." Both Meadows and Parsons want to improve the quality of life for West Virginian youth living in rural parts of the state. Parsons says he wants to see the area, "take the heritage and attitude of 100 years ago and meet today's challenges with it." He expresses a hope that expanded broadband will offer more opportunities and engagement, in both a social and economic sense, than currently exists for Appalachian youth.

"Without strong fiber connectivity, we are depriving [our young people] of opportunity," says Walters.

Making Use of Broadband

The idea of retention is central to the work of Startup High Country, a hybrid incubator and consultancy group in Boone, N.C., that works with Appalachian State University to help keep students involved in the community after graduation. Even though Boone and the surrounding High Country region have broadband infrastructure, James Bance, Chris Grasinger and others at Startup High Country are hoping



Telephone, internet and power lines in North Carolina. Photo by James M. Davidson

to make digital technology more of a focus in the local economy.

The organization's goals are to assist startup businesses and create new high-paying tech jobs in the process. Bance, founder of Startup High Country, emphasizes the focus on the local economy and training local people. "We're never going to aspire to be Silicon Valley," he says.

Grasinger, part of the Startup High Country leadership team, grew up in Blowing Rock, N.C., and hopes that

Boone continues to let "students get hands-on experience with a growing local economy." He also believes that new technology companies can help create stable jobs as broadband continues to expand and existing infrastructure is fully utilized by communities.

"Successful technology companies can offer more living wage opportunities to the households of our region," Grasinger says. "This impact can potentially ripple throughout the region, creating a greater quality of life for our communities."

This impact can be seen at Lincoln Road Coffee, where their ability to tap into a growing broadband network allows the company to reach a much larger market. Now in New York City, San Francisco and Los Angeles, people might open a bottle of Lincoln Road Coffee cold brew and read right on the label that it's brewed "in the heart of the Appalachian Mountains for you to enjoy however you please." ♦

Donald Welch blogs about the intersection of nature and technology on *The Frontier*. Visit thefrontierblog.wordpress.com.

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Consequences and Need for Natural Gas Pipelines Disputed

By Brian Sewell

A decision by federal regulators to forgo a comprehensive review of large natural gas pipelines proposed in Appalachia has not diminished opponents' doubts about the projects, including whether they are needed at all.

In August, the Federal Energy Regulatory Commission made clear it would not conduct a programmatic environmental impact statement to consider the cumulative impacts of the region's proposed pipelines, particularly the Atlantic Coast Pipeline and the Mountain Valley Pipeline, despite months of requests from landowners and citizen groups.

Yet a new study published by Synapse Energy Economics does examine the need for the projects — and concluded that there is none. Based on existing ca-

capacity and projected electricity demand, minor pipeline upgrades would be sufficient to meet demand through at least 2030, the study found. In April, a report by the Institute for Energy Economics and Financial Analysis similarly concluded that the industry tends toward overbuilding, benefitting gas companies and electric utilities but putting ratepayers at risk.

A draft impact statement for the 600-mile Atlantic Coast Pipeline will arrive in December, with a final statement expected next June. The final statement for the 300-mile Mountain Valley Pipeline will come in March. Citizen groups argue that the draft review released in September fails to fully assess the public need, and likely impacts to water quality and the climate. The release of the draft on Sept. 16 initiated a 90-day public comment period.

"FERC once again has its blinders on to the full climate consequences of fracked gas," says Anne Havemann of Chesapeake Climate Action Network, referring to widespread use of fracking to extract natural gas in Northern Appalachia, where the pipelines would begin. Havemann faults the review for acting as if the gas that would be transported by the pipeline "comes from nowhere."

Opponents argue that both projects pose risks to the mountainous terrain, watersheds and ecosystems they would cross, including in the national forests that span Virginia's border with West Virginia. The U.S. Forest Service detailed its concerns about the Atlantic Coast Pipeline route through the George Washington National Forest in a September letter to regulators, warning of threats

to wild trout streams.

In order to protect the silt-free gravel stream beds where trout spawn, the forest plan for the George Washington National Forest restricts activities that could disrupt the streams between Oct. 1 and April 1. But the Dominion Pipeline Monitoring Coalition reports that the utility intends to request waivers for time-of-year restrictions and other important environmental requirements.

Dominion CEO Tom Farrell says the Atlantic Coast Pipeline's scheduled environmental review means that "FERC believes that the route is essentially complete." But opposition has significantly delayed construction and the project's expected in-service date.

Read about Appalachian Voices' involvement on page 22.

Mine Reclamation Pilot Program Breaks Ground

By Eliza Laubach

Workers, including former coal miners, are cleaning up decades of coal waste at an abandoned mine in Pennsylvania, funded by special appropriations from Congress. In August, Secretary of the Interior Sally Jewell visited the Ehrenfield Abandoned Mine Reclamation Project to celebrate the pilot project of the \$90 million Abandoned Mine Lands Economic Revitalization program.

At this particular site, 2.4 million yards of coal waste remains from past mining operations, endangering resi-

dents who live within 500 feet of the pile, according to the U.S. Department of Interior. The mine reclamation is part of a three-year project that will also enhance access to the "Path of the Flood" trail in an effort to increase ecotourism.

This program reflects the goals of the RECLAIM Act, a bipartisan bill now before Congress that aims to develop local economies while reclaiming abandoned mine lands. The Abandoned Mine Lands Economic Revitalization program is funding similar projects in West Virginia and Kentucky, which have yet to begin.

DC District Court Hears Clean Power Plan Case

On Sept. 27, the U.S. Court of Appeals for the District of Columbia Circuit heard oral arguments concerning the U.S. Environmental Protection Agency's Clean Power Plan.

This rule, which is central to meeting the Obama administration's commitment to the 2015 Paris climate talks, seeks to reduce carbon dioxide emissions from electricity generation by 32 percent by 2030. Opponents of the regulation challenge the EPA's authority to regulate carbon emissions under the Clean Air Act.

More than two dozen states join coal companies and some utilities in opposing the regulation, while the EPA is supported by 18 states, public health and environmental

advocacy groups and other utilities.

The 10-judge panel is expected to deliberate the case for several months. Regardless of the outcome, the case will likely be sent to the Supreme Court. But with a Supreme Court vacancy, a 4-4 verdict would give precedence to the appellate court's decision. — Elizabeth E. Payne

Alabama Coal Company Sued for Water Pollution

On Sept. 1, conservation groups announced a lawsuit against Drummond Company for acid runoff from its abandoned Maxine Mine into the Locust Fork of the Black Warrior River near Praco, Ala. The suit was brought by the Southern Environmental Law Center, Public Justice and Black Warrior Riverkeeper, the newest member of The Alliance for Appalachia. — Elizabeth E. Payne

Mountaintop Removal Mine Shut Down in WV

By Eliza Laubach

The KD#2 surface coal mine in West Virginia was permanently halted by state regulators after a two-year, resident-led campaign to close the mine. A consent order signed in mid-July requires Keystone Industries to stop mining and only allows work related to reclamation and maintenance of the site.

Kanawha State Forest Coalition, a local grassroots network, organized the opposition to the KD#2 mine, which state regulators permitted in 2014. The permit allowed mining within 588 feet of the Kanawha State Forest and 1,500 feet of

homes in Loudendale, W.Va. The company disturbed 100 acres, about a quarter of the total area, before permit violations caused state regulators to suspend active mining in early 2015, according to the coalition. The coalition's watchdogging brought many of the 42 violations to state regulators' attention.

"This is ... a powerful demonstration of the impact citizens can have when we take a stand, stay persistent, and don't back down," coalition coordinator Chad Cordell said in a press release. "Many people thought this strip mine was unstoppable when the permit was issued over two years ago."

Petition to Pause Nuke Plant

In a petition to the State Corporation Commission, the Virginia Citizens Consumer Council argued that Dominion Virginia Power must obtain a permit before proceeding with any further construction of a nuclear reactor at the North Anna Power Station. The \$19 billion project has not been approved by regulators and, although it is included in Dominion's long-term plan, the utility has not committed to bringing the reactor into service. Nearly \$600 million has already been spent on preliminary construction, half of which has been passed on to Virginia ratepayers. — Brian Sewell

Duke Energy's 15-year Plan

In its 15-year plan released in September, Duke Energy Carolinas projected a 1 percent growth in electricity demand. But between now and 2030, the company predicts a tripling of

solar capacity and the continued displacement of coal-fired electricity by natural gas. Due to the uncertainty of fuel prices and future regulations, the plan analyzes the possibility of a new nuclear facility in upstate South Carolina. — Brian Sewell

Price of Met Coal Rises

Bucking the nationwide trend, Kentucky-based Ramaco Development, LLC, announced in September that it will begin operations next year at two mines in West Virginia and Virginia. Both mines will produce metallurgical coal used to manufacture steel. After a steep drop in 2015, global prices for metallurgical coal have rebounded in recent months largely, due to demand in China. But it's not clear how many cash-strapped mining companies in Central Appalachia will benefit from the market's shift. — Brian Sewell

N.C. Scientists and State Officials at Odds Over Coal Ash Safety

By Elizabeth E. Payne

August was an eventful month for the coal ash saga in North Carolina. Early in the month, the transcript of the sworn testimony of Dr. Ken Rudo, a toxicologist at the N.C. Department of Health and Human Services, became public.

Rudo raised concerns about language used by state environmental and health officials that downplayed the risks of last year's "do not drink" warnings issued to hundreds of families living near Duke Energy coal ash impoundments.

Two top officials at state agencies responded with an open editorial defending their actions and criticizing "Rudo's unprofessional approach to this important matter."

Following the release of this edito-

rial, Dr. Megan Davies resigned from her position as state epidemiologist at DHHS. "Upon reading the open editorial yesterday evening, I can only conclude that the Department's leadership is fully aware that this document misinforms the public," Davies wrote in her resignation letter. "I cannot work for a Department and an Administration that deliberately misleads the public."

Meanwhile, the Department of Environmental Quality has proposed permits to allow Duke Energy to dispose of wastewater from its coal ash impoundments at its Dan River, Mayo and Roxboro sites directly into nearby waterways. Dan River was the site of the 2014 spill.

Public comments about the plans can be emailed to the agency at publiccomments@ncdenr.gov until Nov. 4.

Miners Protection Act Advances

The U.S. Senate Finance Committee approved a bill aimed at guaranteeing pension and healthcare benefits for more than 100,000 union coal miners, retirees and their families. The Miners Protection Act would preserve United Mine Workers of America pension plans by redirecting interest earned on coal industry fees from the Abandoned Mine Reclamation Fund. The bill's strongest supporters — West Virginia Senators Joe Manchin and Shelley Moore Capito — are calling on Sen. Majority Leader Mitch McConnell to schedule a final vote before the end of the year. — Brian Sewell

Dakota Access Pipeline Stopped, For Now

Protests continue as Native American nations and environmental advocates face off with Energy Transfer Partners in an effort to block construction of the company's Dakota Access Pipeline. This \$3.8 billion project, which is 60 percent complete, would carry crude oil for 1,134 miles from North Dakota to Illinois.

The Standing Rock Sioux hope to block construction of the pipeline near their reservation on the grounds that it threatens their cultural heritage and their drinking water supply. As of press time in late September, more than a thousand people were gathered at an encampment in protest.

On Sept. 9, the Obama administration halted construction of the pipeline near the Missouri River to allow time for the courts to decide on injunctions before them. — Elizabeth E. Payne

New Federal Water Quality Guidance on Selenium

By Eliza Laubach

The U.S. Environmental Protection Agency released final changes to a water quality criterion for selenium in July. The criterion guides state and tribal agency selenium rules and replaces a previous, more stringent, criterion.

Selenium, an essential nutrient for humans in small amounts, is toxic to fish even in small amounts. It accumulates in fish and aquatic organisms that live in contaminated waters and can cause deformations or death. It also can harm birds that eat organisms from contaminated

Agency Announces Coal Bonding Reform, Health Research Review

By Brian Sewell

A series of recent actions by the federal Office of Surface Mining Reclamation and Enforcement reflect the realities of the coal industry's precarious financial position and the profound impacts mining has on nearby communities.

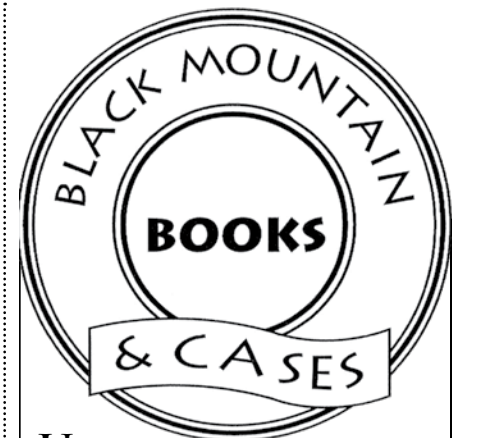
In August, the agency began a rule-making process to strengthen regulations on self-bonding, a practice that allows coal companies to use their financial history to insure the cost of restoring the land after mining, rather than requiring collateral or a more secure bond.

Self-bonding has come under intense scrutiny as some of the nation's largest coal companies have gone bankrupt while responsible for billions of dollars in unfunded mine cleanup costs. Goals

for the reforms include modified eligibility standards and third-party review of companies' financial statements.

Earlier that month, the agency announced that it will fund a \$1 million review by the National Academy of Sciences of current research on the links between surface coal mining and human health risks. The move was applauded by environmentalists and public interest groups, but described as long overdue.

Two dozen peer-reviewed studies dating back to 2007 have found correlations between mountaintop removal coal mining and increased rates of cancer, heart and respiratory diseases, and other negative health outcomes in surrounding communities.

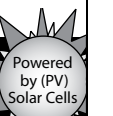


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This detail from "Edge of a Dream" by Lynn Willis shows Joe Lovenshimer ascending Ship Rock in Pisgah National Forest near the Blue Ridge Parkway. The image was a finalist in the 13th annual Appalachian Mountain Photography Competition's Adventure category. The deadline to submit images for the 14th annual photography competition is November 18 at 5 p.m. Learn more at appmntnphotocomp.org

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