

GROWING A RESTORATION WORKFORCE

**Strategies to Repair Damaged Lands and
Reconnect Appalachia's Disconnected Workers**

by Rike Rothenstein and Stephen Herzenberg



With its abundance of forests, wetlands, and farmland, Appalachia is rich in carbon-absorbing natural resources. Along with the mountains, valleys and streams they define Appalachia and the people who call this place home. For too long, however, the Appalachian region has been exploited by absentee corporations in extractive industries, leaving much of the region dealing with the dual issue of economic instability and damaged lands. Climate change accentuates coal country's challenges, as the region faces more frequent and severe weather events, particularly floods. The good news is that, with the right investments, we can repair our damaged lands while helping to tackle climate change through reforestation and wetland restoration. Done right, workforce development programs can contribute to enhance and restore natural infrastructure and build pathways into family-sustaining careers for people with significant barriers to employment.

Introduction

Two big accomplishments of the Biden Administration are the enactment of the Bipartisan Infrastructure Law (BIL) and the Inflation Reduction Act (IRA). These climate and infrastructure investments include significant funds for restoring the region's natural resources by repairing damaged lands, reclaiming abandoned mines, reforesting the region, and restoring wetlands. In this policy report, we will focus on these investments not only as an important building block for addressing climate change and boosting climate resiliency, but also as a much-needed opportunity for reconnecting Appalachia's disproportionately disconnected workforce through targeted employment programs.¹ Smart federal investment that works with natural infrastructure can create pathways into family-sustaining jobs, including for people that have been left out of the workforce for too long. This report refers to natural infrastructure as the natural landscape of the region, from forests to floodplains to wetland systems.

The policy report will describe and illustrate how best practices in workforce development, when coupled with investments in natural infrastructure enhancement, can enable low-wage workers and returning citizens to gain employment at fair wages.² For example, some programs, including many pre-apprenticeship programs, combine training with wrap-around services customized to help people with significant barriers gain and keep stable employment. Target groups include Appalachians hit hard by the opioid epidemic, other substance use disorder, or caught up in the criminal justice system. Federal investments in natural infrastructure enhancement and restoration can also provide pathways into other employment sectors such as permanent high-paying construction careers.

Several existing organizations and businesses in Appalachia model ways to combine federal resources with workforce development efforts from which other communities and the region can learn. One example, Green Forests Work, successfully reforests former mine lands in Appalachia. Two other examples, Landforce and the Trade Institute of Pittsburgh (TIP) provide vocational training and job placement support to adults who have faced structural barriers to stable, family-sustaining employment.

Lastly, this report highlights BIL, IRA and other federal funding streams that could be used to create, expand, or replicate these models. One such federal program, the American Climate Corps program, could

play a particularly large role depending on its guidelines (which are still being finalized) and if Congress passes President Biden’s proposed \$8 billion increase in its funding. Ultimately, given the need for employment creation in our region and the scale of useful tree planting and other natural infrastructure work that could be done, the climate corps should expand to create opportunities for hundreds of thousands of disconnected workers and returning citizens.

The Impact of Climate Change in Appalachia

Climate change poses a significant threat in Appalachia where more frequent and severe weather events collide with an ailing infrastructure, high poverty rates, and damaged lands. The July 2022 flood in Eastern Kentucky shows how the combination of extreme weather and economic distress can have disastrous effects on our Appalachian communities.³ The storm killed 44 people and damaged nearly 9,000 homes. Many of those homes belong to low-income households which have the least ability to rebuild.⁴

According to the National Oceanic and Atmospheric Administration’s State Climate Summaries, Kentucky, West Virginia, Pennsylvania and Ohio will continue to experience two significant developments due to climate change: our area will become wetter and warmer. As a result, Appalachia is likely to have more frequent and more intense rainstorms, increasing the likelihood of flooding.⁵ The region’s rugged topography makes the impact of the floods even more devastating for many of our communities. Deforested coal mining sites pose another potential risk. Their compacted soil is less able to absorb heavy rains and increases the likelihood of water running down the mountains to cause flash floods.⁶ Widespread loss of topsoil on mined sites also reduces absorption of flood waters and adds to downstream damages.

One way to mitigate weather damage working with natural infrastructure is through more “sustainable” agricultural practices such as reduced tillage, cover crops, and pasture grazing (so farm animals not machines harvest what grows). These can increase absorption of flood waters and also reduce drought damage.⁷

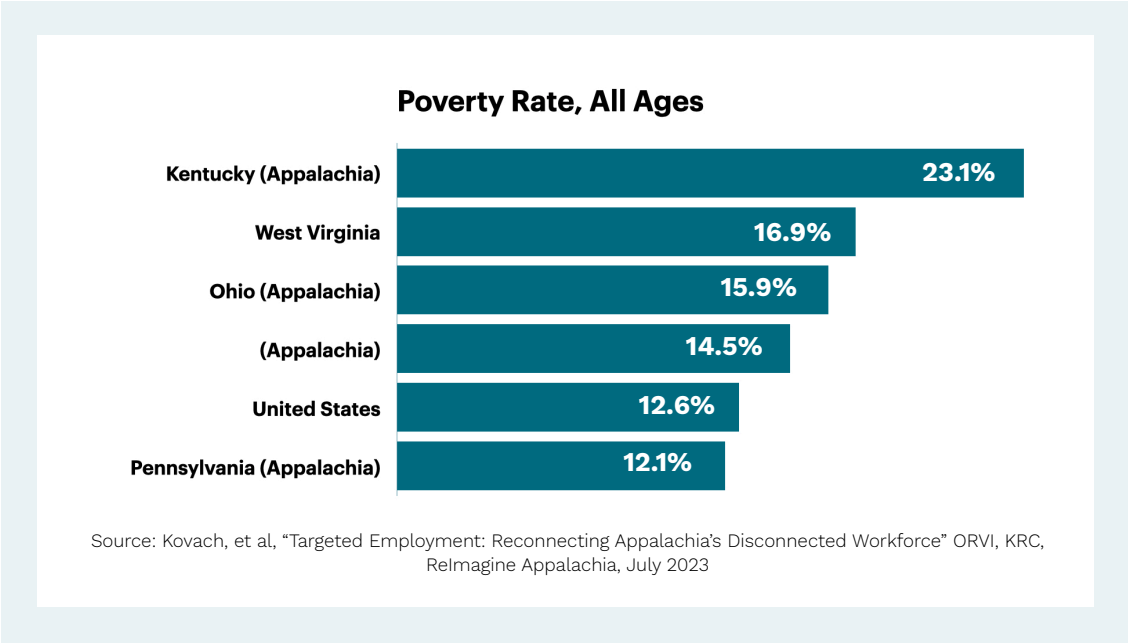
Along with increased extreme precipitation, the four Ohio River Valley states are also more likely to experience more extreme heat waves, especially in urban centers such as the city of Pittsburgh. High temperatures combined with high humidity can lead to dangerous conditions, particularly in low-income urban neighborhoods, which tend to have more tightly packed buildings, more pavement, less tree cover, and higher population density.⁸ Investments in natural infrastructure enhancements such as tree plantings and more park space diminish this heat island effect because they provide shade and cover pavement and cement.⁹

The threats of climate change can be reduced by investments that simultaneously offer employment and pathways to good jobs that are especially needed in the region.

The Need for Expanding Employment in Appalachia

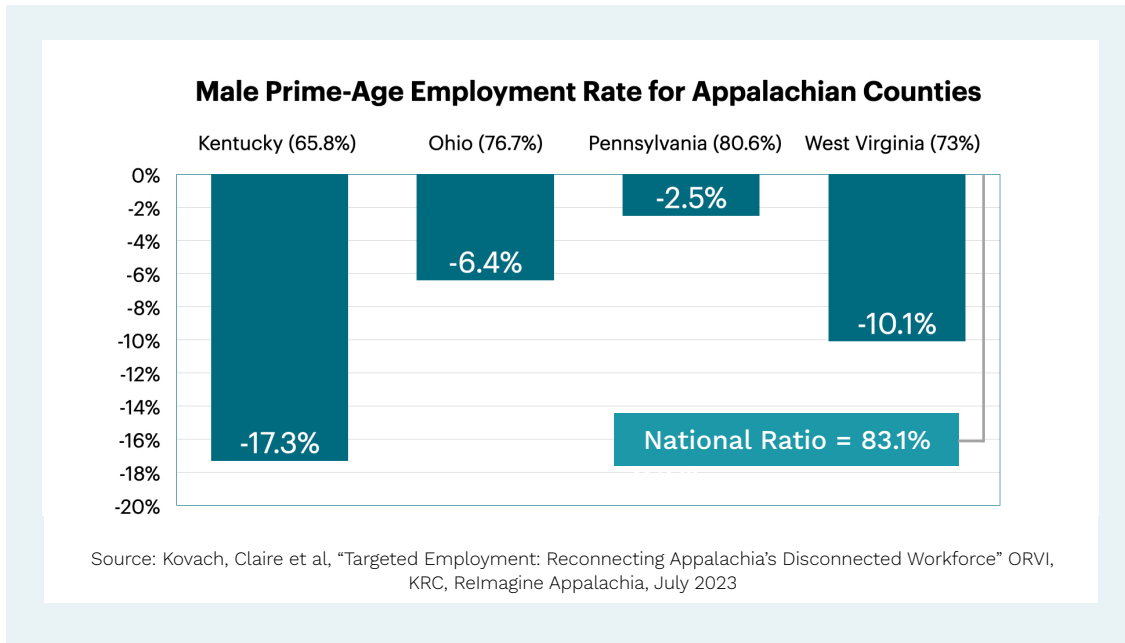
Appalachia needs more good jobs and careers even more than the rest of the country. Our 2023 employment study shows that Appalachia’s poverty rate (14.5 percent) exceeds the national average of 12.6 percent.¹⁰ The Appalachian counties of Kentucky have the highest poverty in the region (23.1 percent), followed by West Virginia (16.9 percent), and the Appalachian counties of Ohio (15.9 percent) (Figure 1).¹¹ Only Pennsylvania’s Appalachian counties have a poverty rate (slightly) below the national average.

Figure 1



The employment rate among individuals aged 25-54 (called “prime-age” individuals) in the region also trails the national rate, with an even bigger gap for prime-age males. The starkest contrast, again, is between Appalachian Kentucky and the United States as a whole (Figure 2). Pennsylvania’s prime-age male employment rate is slightly lower than the national average of 83.1 percent, Ohio’s is 6.4 percentage points lower, West Virginia is about 17 percentage points lower, and Kentucky is over 17 percentage points lower. These low prime-age male employment rates reflect the loss of high paying manufacturing and extraction jobs since the 1970s, with many men becoming disconnected from the job market permanently or for long periods and some families leaving the region and reducing the population. Figure 2 shows how much the region’s male prime age employment rates trail the national ratio of 83.1 percent for each state.

Figure 2



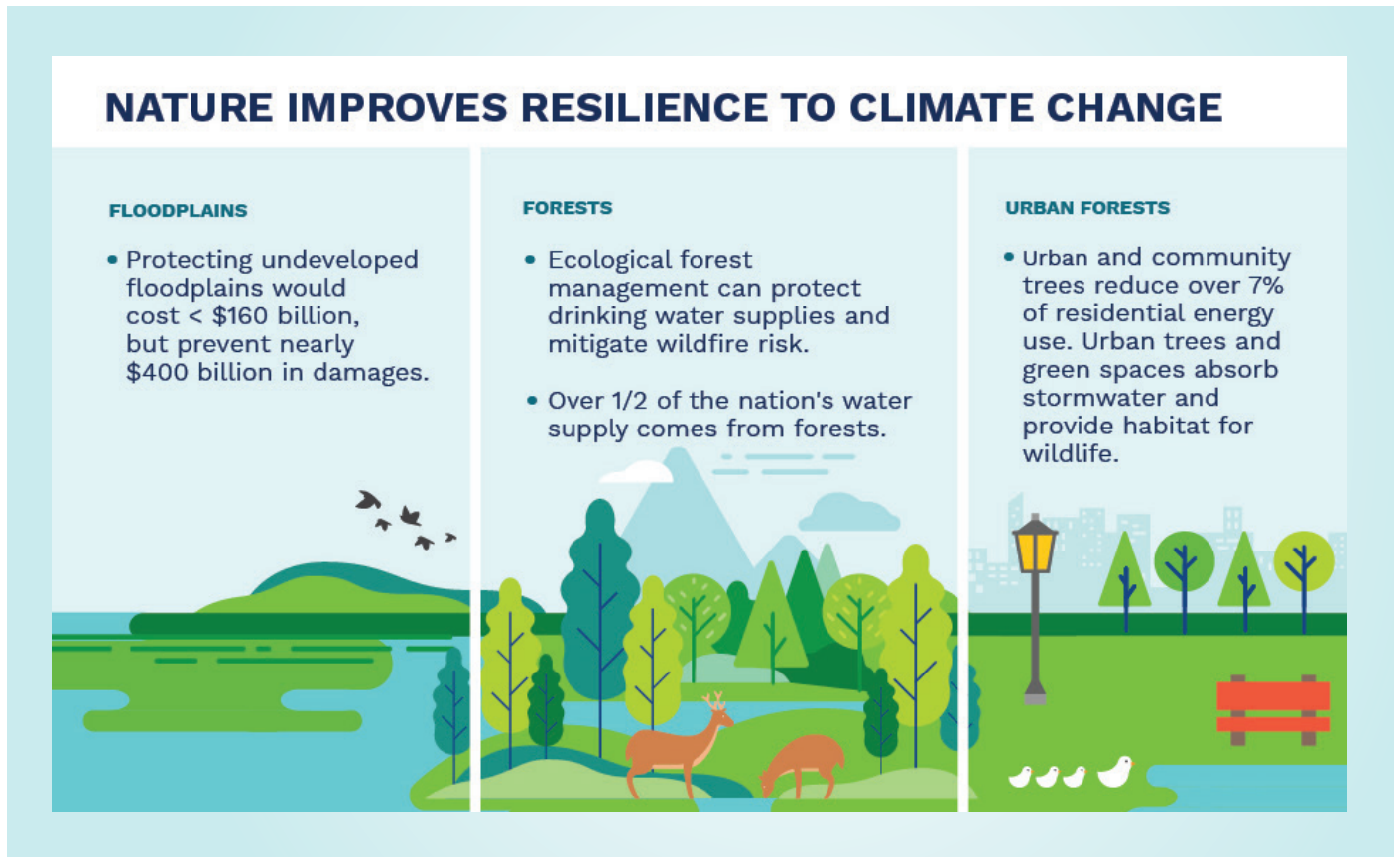
The Potential of Natural Infrastructure Restoration in Appalachia

In this section of the report, we define natural infrastructure, and discuss how the restoration and enhancement of natural infrastructure creates climate resiliency as well as employment opportunities.

What is Natural Infrastructure? A Definition

In this policy report we use the National Wildlife Federation's definition of natural infrastructure which describes it as "natural systems—for example, wetlands, forests, and coral reefs—that provide essential services and benefits to society, such as flood protection, erosion control, and water purification."¹² In addition to natural systems like forests, flood plains, beaches and grasslands, natural infrastructure investments can include projects that create some of the functions of natural systems through engineered features, such as permeable surfaces, and use of natural materials. As fleshed out in the next section, whether enhancement of natural infrastructure itself or man-made replication (or restoration) of natural infrastructure capacities, the result can mitigate the impacts of climate change such as extreme precipitation and excessive heat.

Figure 3



Source: National Wildlife Federation

Ecological and Economic Benefits of Natural Infrastructure Restoration

Evidence suggests that natural and nature-based approaches can often be more effective and less expensive in the long-term than conventional structural approaches such as dams and levees to safeguard communities and reduce risk.¹³ For instance, flooding is the costliest and most severe natural hazard in West Virginia.¹⁴ Addressing the problem with natural infrastructure approaches such as floodplains, reforestation, sustainable agriculture and watershed restorations reduces the risk of flooding, improves water quality, and ultimately saves money for the taxpayers.¹⁵ Clean up and reforestation of abandoned mine lands and modern coal mines is another area with clear ecological and economic benefits. Abandoned mine lands (AML) refers to lands impacted by coal mining prior to the passage of the Surface Mining Control and Reclamation Act (SMCRA) of 1977. AMLs are eligible for federal funds for clean up and reclamation, in contrast to land mined in recent decades, where coal operators are expected to reclaim the land.

Many benefits can result from reclaiming and reforesting former mine lands. These include cleaner streams and rivers that support fish and wildlife, attract tourism and recreation spending, offer newly remediated lands for sustainable reuse, including parks and trails, reduced flooding risks and many other benefits. The states of Pennsylvania, West Virginia, Kentucky and Ohio have over 560,000 acres of AMLs in need of reclamation, or 66 percent of the nation's total AML liability. While remediating half of the

remaining AML sites in the U.S. by 2030 would cost about \$1.3 billion annually, it would also support more than 17,000 jobs.¹⁶ In addition to the burden of unreclaimed AMLs, our communities also have unreclaimed modern era coal mines posing safety and environmental risks. While inconsistent reporting methods make an exact count impossible, research indicates over 600,000 acres of modern surface coal mines in the Eastern United States need reclamation. These acres would cost an estimated \$7.5 to \$9.8 billion dollars to reclaim. Addressing the reclamation backlog for these modern era coal mines would create even more jobs, an estimated 23,000 to 45,000 job-years, helping offset the coal industry's loss of about 27,000 jobs over the last 10 years.¹⁷ Careers in mine reclamation work can be made accessible through pre-apprenticeship and apprenticeship programs, as the work varies from tree planting to heavy equipment operation. In the long-term, the reclamation of mine sites provides the residents of AML counties with cleaner water and healthier lands, giving them a better chance to grow their economies and make their communities more livable.

Another nature-based approach with enormous potential for the mitigation of climate impacts for the region is investment in sustainable agriculture. A 2015 study by the Natural Resources Defense Council found that improving the health of farm soils can reap huge benefits in both flood reduction and drought damage reduction.¹⁸ NRDC found that adding 1 percent additional organic matter to farm soils would enable one acre of farmland to retain an additional 20,000 gallons of rainwater per storm event, greatly reducing downstream flooding. These soils also release floodwater more slowly, helping ameliorate the impact of both droughts and floods on crops and livestock.¹⁹ The cost of improving soils is also very low, an estimated \$37 per acre per year on average to improve soils through cover crops, according to the USDA. No-till and reduced tillage can be similarly cost-effective. These soil restoration practices can also create entry-level jobs accessible through on-the-job training or pre-apprenticeship training.

Workforce Development in Natural Infrastructure Restoration

The employment opportunities reclaiming former coal mines as well as other areas of natural resource restoration are manifold, ranging from scientist to construction worker (see Table 1). Several natural infrastructure restoration occupations rely on transferable skills possessed by people that have previously worked in the coal, gas or oil industries.²⁰

These natural infrastructure restoration jobs may also be accessible for people that have been disconnected from the workforce. To connect people affected by the opioid epidemic or with a criminal record to a family-sustaining job, however, we need an intentional approach. Namely, we need a workforce development approach that combines technical training with wrap-around services to eliminate the barriers to employment many participants face when (re-)starting their careers. Such services can include housing assistance, transportation (including help with getting (back) a driver's license), childcare, access to social services, medical services, and others. Below is a list of blue collar occupations in the field of natural infrastructure restoration or enhancement that can be pursued after such training programs, some of them with additional work experience and / or certifications.

Table 1

Blue Collar Occupations in the Natural Infrastructure Restoration and Enhancement Sector	
Repairing damaged lands/land restoration	Construction Laborer or Foreman, Operator of Power Tools, Heavy Equipment Operator, Truck/Tractor Driver, Forest and Conservation Worker, Nursery / Greenhouse Worker, Arborist, Irrigation Specialist, Clerical/Administration Worker, etc.
Farming, Fishing, Forestry	Faller, Logging Equipment Operator, Log Grader and Scaler, Logging Worker (all others), Fishing and Hunting Worker, Agricultural Products Grader and Sorter, Agricultural Equipment Operator, Farmworker, Nursery / Greenhouse Worker, Ranch Worker, Aquacultural Animal Worker, Agricultural Workers (all others)
Urban Forestry and Parks	Forest and Conservation Worker, Tree Trimmers and Pruners, Landscaping and Groundskeeping Worker or Foreman, Hardscape Worker or Foreman, Nursery / Greenhouse Worker or Manager, Arborist, Irrigation Specialist, etc.

Sources: Dixon, E “Repairing the Damage: Cleaning up the land, air, and water damaged by the coal industry before 1977” ORVI, April 2021; [O*NET OnLine: Occupational Outlook Handbook by the US Bureau of Labor Statistics](#)

In Ohio’s Athens County and Meigs County, Rural Action connects people affected by substance use disorder with part-time employment that includes wrap-around support.²¹ Having part-time employment for up to one year gives 10 participants the needed flexibility to address other demands in their life, such as court dates or providing care for a family member. The Rural Action program is funded through the **Appalachian Regional Commission’s INSPIRE Initiative**, “which aims to address Appalachia’s substance use disorder (SUD) crisis with investments in projects that create or expand services in the recovery ecosystem leading to workforce entry and re-entry.”²² Rural Action is also one of 31 award recipients in central Appalachia that received a **Workforce Opportunity for Rural Communities (WORC)** grant through the Appalachian Regional Commission. The WORC Initiative funds on-the-job and formal training and wrap-around services to workers with significant barriers to employment in the Appalachian, Delta, and Northern Border regions.²³

Funding opportunities such as the Appalachian Regional Commission’s INSPIRE and WORC grants can be used in a host of different sectors, not just for workforce development programs that contribute to natural infrastructure restoration. While recognizing that, with the Bipartisan Infrastructure Law and the Inflation Reduction Act we now have new opportunities to expand workforce development in the field of natural infrastructure restoration. As these targeted employment programs scale, they should be deliberate about connecting pre-apprentice trainees to union apprenticeship programs, higher education, or ongoing jobs as their next step. This is how to create a career pathway towards family-sustaining wages rather than simply a job.²⁴ An example of a pre-apprenticeship program with links to registered apprenticeships is offered by the Trade Institute of Pittsburgh (see Box 1).

TRADE INSTITUTE OF PITTSBURGH

The Trade Institute of Pittsburgh (TIP) is a vocational training provider dedicated to offering opportunities for individuals facing barriers to employment. These individuals may include those reentering society following incarceration, those chronically underemployed, those struggling with addiction, and others who need additional support to get their lives on track. TIP is located in the Homewood community of Pittsburgh, Pennsylvania.

Over the last decade, the Trade Institute has placed over 700 men and women throughout Allegheny County into jobs with self-sufficient wages. (Self-sufficient wages are determined by Partner4Work, the local workforce investment board, and are currently set at 250 percent of the Federal Poverty Guidelines. As of March 2024, an hourly self-sufficient wage for an individual in the Pittsburgh Region is \$16.33 per hour.)

The Trade Institute's model works: a growing group of contractors and construction companies hire 98 percent of its graduates at \$19+ per hour. Tuition-free programs offered by TIP include an 11-week Masonry Program and a seven-week Carpentry Program. Along with vocational training, TIP offers a host of wrap-around services, including education in financial literacy, math for the trades, resume and interview coaching, and driver's license preparation. Furthermore, TIP students work with a life coach one hour per week to discuss individual goals related to relationships, finances, health, etc., and are given a personalized plan to achieve those goals. Finally, TIP students also have one-on-one access to a case manager who identifies all barriers to sustained employment and develops a set of goals and steps to eliminate those barriers through a holistic approach.

Federal Natural Infrastructure Improvement Programs

In this section of the paper, we discuss federal funding streams for this work. Our recommendation is to expand those funding streams so that they can provide more opportunities for disconnected workers.

Funds Related to Abandoned Mine Land (AML) Reclamation

The Bipartisan Infrastructure Law (BIL) and the Inflation Reduction Act (IRA) include significant resources for natural infrastructure improvement solutions that will create opportunities for a better and healthier Appalachia. Public spending on restoring natural infrastructure can harness the ability of natural systems

to mitigate climate change and to better protect communities when faced with weather-related events. The restoration of degraded land can also support nature-based recreation and tourism, and boost the local economy overall.

Funding for Abandoned Mine Lands (AML) remediation increased tremendously under the Bipartisan Infrastructure Law (BIL). These laws also encourage the states and tribes that receive funds to adopt worker-friendly practices. For instance, BIL asks recipients to give preference to former and current employees of the coal industry on AML reclamation projects. BIL guidance recommends that States and Territories incorporate this preference in their criteria for awarding contracts and to engage with labor and worker organizations that represent coal workers in the procurement process. BIL AML guidance also encourages States and Tribes to give preferential funding to projects that would help meet the Justice40 Initiative goal that 40% of funding go to disadvantaged communities.²⁵ While BIL AML grants cannot be used to directly fund pre-apprenticeship, apprenticeship, or youth training programs, States and Tribes can give priority to bids from contractors that include paid on-the-job training opportunities for apprentices and pre-apprentices.²⁶ This provides a great opportunity to connect federally funded mine reclamation work with existing workforce development programs including those that focus on people with significant barriers to employment.

Building trades unions, including the International Union of Operating Engineers (IUOE) and, in recent decades, the Laborers' International Union of North America (LIUNA) operate the most powerful infrastructure of existing workforce development programs in Appalachian coal country that train new workers for the type of heavy construction work most commonly associated with mine reclamation as well as orphan oil and gas well remediation—the longstanding apprenticeship programs organized by each trade in partnership with contractors.²⁷ Historically, it has been difficult for women and people of color to get into apprenticeship and union construction careers. But in the past 15 years, the diversity of trades apprentices in the region has increased. To increase diversity, moreover, regional building and construction trades groups (e.g., in Columbus, Pittsburgh, and Louisville), and some individual trades, have established pre-apprenticeship programs that help low-income, diverse workers and women qualify to enter apprenticeship.²⁸ The expansion of funding for mine reclamation and natural infrastructure programs can reinforce the growing inclusivity of unionized trades and their apprenticeship programs. Bids for this work should go to high-road, union companies committed to creating family-sustaining careers for diverse workers with high health and safety standards.

The initial phases of mine reclamation, funded through AML grants, tend to focus on the stabilization of dangerous features, such as removing highwalls and open mine shafts, and less on the restoration of native vegetation to the sites. The need for better revegetation of reclaimed coal mine sites around the region has been a concern for decades, and has been addressed by a few new programs.

One program investing in such economic development efforts is the **Abandoned Mine Land Economic Revitalization (AMLER) Program**. Since 2016, the program has supported over 190 projects in Kentucky, Ohio, Pennsylvania, and West Virginia that are projected to create and retain over 30,000 direct jobs, and to attract millions of visitors to destinations such as The Wilds, a conservation park for wild animals in Ohio.²⁹ Another example of an AMLER funded project is the Friendship Park Highwall Reclamation Project in Jefferson County, Ohio which won the 2023 National AML Reclamation Award.³⁰ This former mining site with dangerous highwalls and unstable ground has been transformed to a beautiful recreation area with trails meandering along wetlands, prairie and forest areas.³¹ The improvements expand the already existing Friendship Park and are designed to increase visitation and create long-term economic benefits for the Friendship Park District and surrounding communities.³²

Another program essential to Appalachian natural infrastructure restoration is the **Appalachian Regional Reforestation Initiative (ARRI)**. ARRI is a collaboration between the federal Office of Surface Mining Reclamation and Enforcement, state regulatory authorities, NGOs, colleges and universities, and other

entities. ARRI promotes a set of reclamation methodologies leading to successful reforestation of coal mines. Prior to the Surface Mining Control and Reclamation Act of 1977 (SMCRA), most mined sites were not reclaimed at all, and companies left behind scarred landscapes with no trees and little topsoil. Even after passage of SMCRA, mine site reclamation was poorly understood, and emphasized compacting soils on the theory that rainwater wouldn't infiltrate and release more acid mine drainage; unfortunately, these practices actually made sites more prone to rapid and higher runoff during storm events.³³ This compaction also made it impossible to grow new trees or much useful vegetation.

The nonprofit Green Forests Work raises funding to reforest surface mines reclaimed since passage of SMCRA. In its reforestation work, Green Forests Work engages student groups and other youth organizations, such as the Appalachian Conservation Corps, using ARRI methods that re-loosen soils and pile it in small hills more conducive to trees rooting, absorbing water, and growing (Box 2). Exposing youth to ARRI practices can give youth a broad grounding in forestry, from reforestation to riparian buffer planting to landscaping. An estimated 1 million acres of non-forested, bond released mined lands could be reforested in the Eastern United States. In sum, a scaled-up version of this highly successful program could have enormous positive impacts for the region's workforce and the environment.³⁴

Box 2

GREEN FORESTS WORK

Green Forests Work aims to convert reclaimed non-native grasslands into healthy, productive, native forest types by planting trees on former surface mines. Most former mines in Appalachia were forested prior to mining, so reclamation can restore all of the ecosystem services that forests provide, including the production of timber and non-timber forest products, buffering of storm events and flooding, carbon sequestration, protection of biodiversity, filtering of air and water, soil health, and generating tree crop revenue streams like nuts. Green Forests Work combines job development, ecological restoration, and environmental education and outreach.

Green Forests Work was originally envisioned as a CCC-style program focused exclusively on the reforestation of former surface mines. Green Forests Work later expanded its approaches to include assisting local contractors with site preparation and wetland (re)creation, and partnering with nurseries to procure the necessary plants. Green Forests Work utilizes both volunteer and paid tree-planting crews, as well as the Appalachian Conservation Corps.

In 2023, Green Forests Work planted more than 1 million trees across nearly 2,200 acres, and spread hundreds of pounds of native grasses and wildflower seeds, engaging more than 2,000 volunteers and professionals. Since 2009, Green Forests Work and its partners have planted nearly 6.1 million trees on over 11,600 acres. The work of reclaiming degraded lands has many stages, from planning and fundraising, to collecting seeds and growing them into seedlings in nurseries, to outplanting seedlings, to monitoring and maintaining plantings, and then beginning the process all over again on an annual basis. There is also work involved in site preparation and wetland creation, which often requires operating heavy equipment and other skill sets already possessed by those who have worked in extractive industries such as mining.

Programs Reviving the Civilian Conservation Corp Concept

Another program that connects youth and young adults with training in natural infrastructure work is the National Park Service's **21st Century Conservation Service Corps & Civilian Climate Corps Program (21CSC/CCC)**. The 21CSC/CCC program provides service, training, education and employment opportunities to U.S. citizens and legal residents between the ages of 16 and 30, and to veterans up to 35 years of age. Participants learn conservation practices such as trail management and habitat restoration, as well as historic and public site renovation and construction. The program supports work in National Parks and at National Historic Landmarks as well as in the local communities of partnering organizations more accessible to many potential participants. Preference may be given to youth or conservation corps organizations that target youth from disadvantaged backgrounds and / or communities. These are demographic groups that traditionally have had difficulties entering corps programs.³⁵ With the 21CSC/CCC as well as the newly established American Climate Corps (ACC) detailed below, the government has the opportunity to offer programs that are accessible to everybody, including people that often face barriers to entering existing workforce programs.

In September 2023, the Biden Administration announced the creation of the **American Climate Corps (ACC)** to create pathways to good jobs in the clean energy and climate resilience economy for 20,000 young people. Effectively modernizing the approach of the New Deal's Civilian Conservation Corps, the ACC will offer participants paid, skill-based training needed for restoring land, improving communities' resilience to natural disasters, and installing clean energy systems where they live. The program will prioritize communities that have been traditionally left behind, as well as the energy communities that powered our nation for generations. The federal guidelines for the American Climate Corps have not yet been finalized, and the Biden Administration continues to seek input through the ACC Implementation Team. The final guidelines should include measures, such as wrap-around services, that enable returning citizens, people affected by the opioid crisis, and others with barriers to employment to have a fair chance at starting a family-sustaining career. These positions should also pay a living wage. Historically, service programs have paid at or below minimum wage, making them unaffordable for many workers and most accessible to college graduates whose families supplement their income.

As part of the American Climate Corps, the Biden Administration announced another exciting initiative, the Working Lands Climate Corps (WLCC). The WLCC will provide paid opportunities for more than 100 young people across the country in its first year, training the next generation of conservation and climate leaders in climate-smart agriculture. Besides technical skills training, the jobs also offer education awards and career pathway opportunities.

In addition, the EPA's Environmental and Climate Justice Community Change Grant Program, announced in November 2023, includes an option for community-based organizations to propose their own Climate Corps programs. These programs must enable youth in disadvantaged communities to "pursue careers in greenhouse gas and air pollution reduction, along with other strategies to take climate action, reduce pollution, and increase community resilience"³⁶

Urban and Community Forestry Program

Through the Inflation Reduction Act, the Forest Service's **Urban and Community Forestry Program** received a historic \$1.5 billion in grants funding that helps to bring expanded tree canopy to our cities, towns and suburbs. Urban trees and forests help to mitigate extreme heat, conserve energy, absorb

stormwater, create wildlife habitat, and filter air and water. Furthermore, they improve our mental health and well-being, increase property values, and create opportunities for natural resource restoration jobs such as nursery tree production, tree planting and maintenance, and landscaping.³⁷ In Ohio, the program funds Rising Appalachia's unique apprenticeship program in agroforestry and sustainable forestry with the goal to train future entrepreneurs that plan to start independent businesses in those areas such as forest management consultation, edible landscaping, and gourmet mushroom farming.³⁸

Other projects funded through the Forest Service's program focus more on enhancing tree canopy in disadvantaged urban neighborhoods while creating new job opportunities. Examples are the Mahoning Valley TreeCorps project (\$5 million), in Youngstown and Warren, OH, and the Pittsburgh Canopy Alliance's urban tree canopy project (\$8 million) in Pittsburgh, PA. In Ohio the two participating cities will develop a basic tree inventory and management plan, and plant 5,500 two-inch caliper trees in parks and greenspaces. They will provide forestry training to 75 local professionals and 75 young adults, create at least five living wage jobs, and will fully involve neighborhood residents.³⁹ The Pittsburgh urban tree canopy project will increase tree canopy and develop a more resilient urban forest. It requires community-level planning and workforce development to plant and maintain trees along streets, in parks and public greenspaces, and on residential and institutional property within Justice 40 zones. Landforce, which is a member of the Pittsburgh Canopy Alliance, will use some canopy project funds to apply its outdoor restorative training approach to tree planting work (see Box 3).

Landforce provides workforce training to adults who have faced structural barriers to stable, family-sustaining employment based upon race or personal histories. It meets trainees where they are, and combines skills training with targeted services and coaching so all participants can unlock their full potential. Landforce's mission is not only to teach specialized work skills in natural infrastructure restoration, but to foster life skills that enable each trainee to pursue a pathway toward a dignified and sustaining career.

LANDFORCE

Landforce is an environmental employment social enterprise based in Pittsburgh, PA. As its tagline says, Landforce “invests in people” and land restoration. By providing training, transitional environmental jobs, and career coaching to people typically excluded from family-sustaining jobs, Landforce’s model has shown that meaningful work and family sustaining wages are not limited to people born into financially and socially advantageous situations. Landforce’s crew members now share the unexpected benefits of working in nature, from starting the day to the sound of birds, working in the forest, uprooting an invasive species, and directly supporting the improvement and functionality of outdoor, community spaces. By focusing on the whole person and their strengths, rather than their struggles, the workplace becomes more human and allows people to show up as their whole selves.

While a focus on restorative practices and the healing effects of outdoor work show positive contributions to re-entry, successful workforce development programs should also provide wrap-around services and pay a living wage. Re-entry and recovery come with a variety of challenges, including but not limited to, safe, secure housing, transportation, access to social services and medical services, food insecurity, and paying for boots or other career-specific equipment. Landforce provides weekly touch points and individualized career coaching for crew members, and check-ins continue for 18 months after crew members exit the program. Landforce also has an open door policy and a growing alumni group. Former crew members can come back at any time to seek additional employment and case management support. Assistance with navigation of the county assistance office, coaching through the local financial empowerment center, transportation support, and help obtaining a driver’s license are common case management needs that Landforce accommodates.

Landforce recruits adults, 18 and up, and each employee goes through eight weeks of paid training. Crew members have the opportunity to earn higher wages as their skills develop, topping out at \$16 per hour. Crew members who successfully complete the program also receive a \$1 bonus for every hour completed while in the program. Since its founding in 2016, Landforce has hired over 150 crew members who have received 14,000 hours of training and 2,000 hours of case management. In a typical year, 92 percent of those who finish the program go on to other employment within two weeks of completing the season. Landforce has also contributed over 65,000 hours of environmental stewardship to the Pittsburgh region with more than one million dollars in earned contract revenue coming from over 30 distinct partnerships.

Conclusion

This report details a few of many federal programs that can help heal damaged lands in Appalachia, counteract effects of climate change through carbon sequestration and flood mitigation, and offer workforce development options. Many of these federal funds increased considerably with the Bipartisan Infrastructure Law and the Inflation Reduction Act, and are applicable across the Ohio River Valley region of Appalachia (see Appendix for a more comprehensive list). The funds enable organizations and communities to sustainably improve their natural resources and to create workforce opportunities for all.

In its recently published “Nature-Based Solutions Resource Guide 2.0” the Biden Administration identifies 140 federal funding programs that can be used to support natural infrastructure restoration projects all over the United States.⁴⁰ With this extensive list of unprecedented funds the administration highlights the positive impact of natural infrastructure regarding climate change mitigation, flood mitigation and stormwater run-off, as well as its potential in workforce development.

This report described workforce development programs and funds that can help Appalachia’s disconnected workers to (re-)enter the job market and to set on a pathway towards a family-sustaining career. Too many prime age adults (25-54 years of age) in central Appalachia are out of work resulting in population loss that continues to hurt the region. We need to bring more of these funds to Appalachia to support sustainable career paths for all, including those with significant barriers to employment, and to heal the scarred and polluted landscape a diminished coal industry has left behind.

For this work to continue, we need investments from Congress, supported by the Biden Administration, to grow programs like the American Climate Corps. This should include federal programs through AmeriCorps, the Environmental Protection Agency, and the Departments of the Interior, Commerce, Agriculture, Energy, and Labor—receiving funding streams to increase communities’ access to climate corps program and project opportunities that offer hands-on experience on resilience and clean energy projects and lead to career pathways.

The announcement of the American Climate Corps was met with strong public interest, and President Biden proposed to triple the size of the corps in a decade during his State of the Union speech in March 2024. His FY2025 budget released in March 2024 called for an \$8 billion expansion of the American Climate Corps to employ an additional 50,000 corps members per year by 2031. Even \$8 billion would be a small down payment on a climate corps big enough to make a dent in the decline nationally in male employment rates since the 1960s (a decline equivalent to six million missing jobs) and big enough to make the maximum contribution to carbon emissions reduction possible through tree planting, wetlands restoration, and regenerative agriculture. Recall that the original New Deal CCC employed 3 million people over 10 years, the equivalent of over 10 million today, because the United States workforce has grown more than three times. Only a CCC program that approaches that scale would fully capitalize on the common sense potential to connect the millions of long-term jobless with the massive amount of useful outside work that could combat climate change, restoring dignity and hope to disconnected workers by deploying them as essential workers of climate response.⁴¹

An additional source of investments for this essential work could be the Farm Bill, which should support adoption of sustainable and climate resilient agriculture and forestry practices. The Working Lands program has been a successful model for soil health, especially within the Conservation Stewardship Program. The Environmental Quality Incentives Program (EQIP) is another highly successful conservation

program. Another Farm Bill funded program that could support natural infrastructure solutions is the USDA's Natural Resources Conservation Service (NRCS). The NRCS supports innovative conservation practices such as multi-cropping that can reduce flooding.

The historic climate infrastructure investments made through the Bipartisan Infrastructure Law and the Inflation Reduction Act have given a significant boost to many other struggling communities. These investments, including climate smart agriculture investments in the Inflation Reduction Act, should be protected from cuts. The agencies implementing these programs must be properly funded to maximize the value of these investments, and we must pass a strong Farm Bill that supports climate resilient practices.

Appalachian communities are rolling up their sleeves to build the brighter future we want to see, but our communities need support to cope with the realities of historic disinvestment alongside a changing energy and economic landscape. Only if everybody has a fair chance to build a dignified, family-sustaining career can we prosper as a region and nation.

Appendix

Table 2

Federal Climate and Infrastructure Funds				
Program	Department	Funding type	Program description	Eligible recipient
Funds related to former mine land reclamation				
<u>BIL Abandoned Mine Lands (AML) grants</u>	DOI	Grant	Cleaning up abandoned mines and mine lands, as well as related land and water resources (mine must have been abandoned pre-1977). Unlike traditional Abandoned Mine Land funding, funding under the BIL may be used to design, build, operate, maintain, and rehabilitate acid mine drainage facilities that are not in conjunction with a Priority 1 or Priority 2 site. However, States and Tribes may not place a portion of their BIL funding into acid mine drainage set-aside accounts.	States, Tribes
<u>Abandoned Mine Land Economic Revitalization Program (AMLER)</u>	DOI	Grants	AMLER intends to explore and implement strategies that return legacy coal mining sites to productive uses through economic and community development. While not the program's focus, the funds could be expended on revegetation efforts.	Eligible states (including KY, OH, PA, WV) and Tribes work with partners that submit applications to the state.
<u>Appalachian Regional Reforestation Initiative (ARRI)</u>	DOI	Ad-hoc funding through various programs, no dedicated grant	ARRI is a coalition between the Office of Surface Mine Reclamation and Enforcement and state agencies, nonprofits, higher ed institutions, and citizens, dedicated to restoring forests on coal mined lands in the Eastern United States.	
Funds related to natural infrastructure restoration and enhancement in communities				
<u>Urban and Community Forestry Grants</u>	USDA/FS	Grants	A technical, financial, and educational assistance program, delivering nature-based solutions to ensure a resilient and equitable tree canopy where more than 84 percent of Americans live.	State agency, local governmental entity, Tribes, or nonprofit.
<u>Community Forest and Open Space Conservation Program</u>	USDA/FS	Competitive grant (50% cost share)	Communities can acquire and conserve forests that provide public access and recreational opportunities, protect vital water supplies and wildlife habitat, serve as demonstration sites for private forest landowners, and provide economic benefits from timber and non-timber products.	Local government. Tribes, nonprofit organizations
<u>Community Change Grants</u>	EPA	Competitive grants and technical assistance	The program benefits disadvantaged communities through projects that reduce pollution, increase community climate resilience, and build community capacity to address environmental and climate	CBOs, local government, Tribes, higher ed institutions

			justice challenges. The grant may be used in investments in low and zero-emission and resilient technologies and related infrastructure and workforce development that help reduce greenhouse gas emissions and other air pollutants.	
<u>Neighborhood Access and Equity Grant Program</u>	DOT	Grants	This program provides grants to help reconnect neighborhoods divided by infrastructure through locally tailored projects and additionally aims to mitigate or remediate negative impacts on the human and natural environment. Eligible for managing stormwater run-off using natural infrastructure.	State, local government, MPO, Tribes, special purpose district or public authority with a transportation function; nonprofits or higher ed institutions in partnership with former mentioned entities
<u>Reconnecting Communities and Neighborhoods Program</u>	DOT	Grants, technical assistance	The program addresses infrastructure barriers, reconnects communities, and improves quality of life. Eligible projects can include high-quality public transportation and infrastructure removal. Natural infrastructure, like linear parks and trails, roadway redesigns, complete street conversions, and main street revitalization, also qualify for funding.	States and local governments, Tribal governments, metropolitan planning organizations, and nonprofits
<u>Surface Transportation Block Grant</u>	DOT	Grants	The program provides flexible funding that may be used by states and localities to best address their transportation needs. Natural infrastructure projects are an eligible use of funds.	State and local government
Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT) - Formula and Discretionary	DOT	Grants	The PROTECT program improves the resilience of surface transportation systems (e.g. highways, public transit, ports, intercity passenger rail). Natural infrastructure projects are explicitly eligible under the program. Conservation, restoration, or construction of riparian and streambed treatments, marshes, wetlands, native vegetation, stormwater bioswales, breakwaters, reefs, dunes, and shade trees are listed as possible nature-based solutions.	States (formula); state, metropolitan planning organization, local government, special purpose district or public authority with a transportation function, Tribes, federal land management agency (applying jointly with State(s)) (discretionary)
<u>Choice Neighborhoods Program</u>	HUD	Grants	Relevant <u>example</u> (p. 15): In Pittsburgh, Pennsylvania, the Housing Authority of the City of Pittsburgh used a \$30 million Choice Neighborhoods grant to transform 14,500 square feet of underutilized land into Liberty Green Park. This greenspace was built to reduce flooding and provide recreation and gathering space for the community.	Local government, Tribes, public/Indian housing authorities, nonprofits,

Agriculture-related funds

<u>Environmental Quality Incentives Program (EQIP)</u>	USDA	Cooperative Agreements, Grants, Contracts	The program provides technical and financial assistance to producers to address natural resource concerns and deliver environmental benefits.	Agriculture producers, farmers, ranchers, and forest landowners
<u>Conservation Stewardship Program (CSP)</u>	USDA	Cooperative Agreements, Grants, Contracts	The program offers technical and financial assistance to compensate agricultural Agriculture and forest	Agriculture producers, farmers, ranchers, and forest landowners

			producers who agree to increase their level of conservation by adopting additional conservation activities and maintaining their baseline level of conservation.	
<u>Regional Conservation Partnership Program (RCPP)</u>	USDA	Cooperative Agreements, Grants, Contracts	The program funds solutions to natural resource challenges on agricultural land by leveraging collective resources and collaborating to implement natural resource conservation activities.	Tribal organizations, farmer/rancher/agriculture producer, land/property owner, state/local sponsored organization, Tribal governments
<u>Conservation Technical Assistance (CTA)</u>	USDA	Cooperative Agreements, Grants, Contracts	To provide conservation technical assistance to farmers, ranchers, and forestland owners to help them to conserve, maintain, and restore the natural resources on their lands and improve the health of their operations.	Individuals, groups, and communities that make natural resource management decisions on private, Tribal, and other non-federal lands
<u>Assistance to Underserved Forest Landowners - Emerging Private Markets for Climate Mitigation and Forest Resilience</u>	USDA	Grant	The program supports the participation of underserved forest landowners in emerging private markets for climate mitigation or forest resilience providing technical assistance.	Tribes and Tribal organizations; national, regional, local, and community-based organizations; nonprofit and for-profit entities; and state and local governments

Natural disaster mitigation funds

<u>Flood Plain Management Services Program</u>	U.S. Army Corps of Engineers	Technical assistance	This assistance can be used toward addressing floodplain and off-floodplain use changes, flood risk, and flood hazards, including through natural and nature-based solutions.	State, regional, or local governments, other non-federal public agencies, and Tribes
<u>Hazard Mitigation Assistance Programs</u>	FEMA	Grants	These programs aim to shift funding away from reactive post-disaster recovery to pro-active investment in community resilience and pre-disaster mitigation activities.	State, local, tribal, and territorial governments
<u>Flood Mitigation Assistance Grants</u>	FEMA	Grants	These grants are focused on projects that reduce flood risks posed to repetitively flooded properties insured under the National Flood Insurance Program.	State, local, tribal, and territorial governments
<u>Building Resilient Infrastructure and Communities (BRIC)</u>	FEMA	Grants	The program supports eligible entities as they undertake hazard mitigation projects, reducing the risks they face from disasters and natural hazards. Funding for nature-based solutions is included in this program.	State, local, tribal, and territorial governments

Table 3

Federal Workforce Development Funds

Program	Department	Funding type	Program description	Eligible recipient
Funds related to former mine land reclamation				
ARC INSPIRE	ARC	Grants	The Investments Supporting Partnerships In Recovery Ecosystems (INSPIRE) is an initiative addressing the substance use disorder (SUD) crisis by creating or expanding a recovery ecosystem that will lead to workforce entry or re-entry. Projects will support the post-treatment to employment continuum, which could include investments in healthcare networks that support substance abuse recovery professionals, recovery-focused job training programs, as well as initiatives designed to coordinate, or link, recovery services and training that support the recovery ecosystem, among others.	Local Development Districts, Tribes, States, local government, higher ed institutions, nonprofits
ARC ARISE	ARC	Grants	The Appalachian Regional Initiative for Stronger Economies (ARISE) aims to drive large-scale, regional economic transformation through multi-state collaborative projects across Appalachia. ARISE encourages the region's 13 states to think beyond local and state lines and to spearhead initiatives that encourage states to work together as one, united Appalachia to advance one or more of these goals 1.) building workforce developments, 2.) building businesses, 3.) building infrastructure, 4.) building regional culture and tourism, or 5.) building leaders and community capacity	Local Development Districts, Tribes, States, local government, higher ed institutions, nonprofits
Workforce Opportunity for Rural Communities (WORC) Initiative	DOL/ARC	Grant	The Initiative's purpose is to support economic mobility, address historic inequities for marginalized communities of color and other underserved and underrepresented communities, and produce high-quality employment outcomes for workers who live or work in the Appalachian, Delta, and Northern Border regions, enabling them to remain and thrive in these communities. The WORC Initiative is designed to address persistent economic distress by aligning community-led economic and workforce development strategies and activities to ensure long-term economic resilience and enable workers in the regions to succeed in current and future job opportunities.	States, local governments, Tribes, workforce development board, education agencies, independent school boards, labor organizations, worker organizations, labor-management partnerships, higher ed institutions, public/Indian housing, Nonprofits
American Climate Corps	DOI	Grants	The American Climate Corps is a new initiative that will provide the next generation of Americans with job training and service opportunities to work on a wide range of projects that tackle climate change – including restoring coastal	TBD

			wetlands, deploying clean energy, managing forests to improve health and prevent catastrophic wildfires, implementing energy efficient solutions, and more.	
<u>21st Century Conservation Service Corps & Civilian Climate Corps Program</u>	NPS		The program provides service, training, education and employment opportunities for young Americans (age 18-30) and veterans (, including low income and disadvantaged youth. The program will protect, restore, and enhance public and tribal lands and waters as well as natural, cultural, and historical resources and treasures. The goal of the program is to connect its work to the overarching goal of tackling climate change.	Any entity type (including nonprofit organizations) qualified as youth of conservation corps
<u>YouthBuild</u>	DOL	75 awards	Pre-apprenticeship services that support education, occupational skills training, and employment services to opportunity youth, ages 16 to 24, who are performing meaningful work and service to their communities. The YouthBuild program model prepares participants for quality jobs in a variety of careers, in diverse industry sectors, particularly in infrastructure sectors, and includes wrap-around services - all key strategies for addressing violence in communities. (mostly construction, some service industry, no natural infrastructure)	Public or private nonprofit agencies or organizations, including consortia of such agencies or organizations
<u>AmeriCorps</u>		Grant	AmeriCorps members and AmeriCorps Seniors volunteers serve directly with nonprofit organizations to tackle our nation's most pressing challenges. AmeriCorps volunteers work with partner organizations in various areas. AmeriCorps members support climate change mitigation, build affordable housing, provide disaster response, and more.	Nonprofits, faith-based organizations, local municipalities or city government, state government, federal government, Tribes, National or State Parks, Forests, or other public lands, and schools
<u>Brownfield Job Training grant</u>	EPA	Grants (24 awards expected in 2024)	The program aims to recruit, train, and place unemployed and under-employed residents in various aspects of hazardous and solid waste management, including sustainable cleanup and chemical safety.	General Purpose Unit of Local Government, Land Clearance Authority or other quasi-governmental entity, Government entity created by State Legislature, Regional Council, Redevelopment Agency, State, Tribes, Nonprofits, Higher Ed Institutions

Endnotes

- 1 See ReImagine Appalachia blog [New Report: Re-Connecting Appalachia's Disconnected Workforce through Targeted Employment](#)
- 2 [On Ramps to Construction Careers in Appalachia](#)
- 3 [Resilience and Recovery: Insights from the July 2022 Eastern Kentucky Flood](#)
- 4 [Housing Damage from the 2022 Kentucky Flood](#)
- 5 [State Climate Summaries](#)
- 6 [Three Reasons Appalachia's Risk of Deadly Floods Keeps Rising | Scientific American](#)
- 7 [Climate-Ready Soil: How Cover Crops Can Make Farms More Resilient to Extreme Weather Risks](#)
- 8 [Widespread Race and Class Disparities in Surface Urban Heat Extremes Across the United States](#)
- 9 [The Protective Value of Nature](#)
- 10 https://reimagineappalachia.org/wp-content/uploads/2023/07/Repot_Targeted-Employment_FINAL.pdf
- 11 Appalachian counties of Kentucky, Ohio and Pennsylvania correspond with the Appalachian counties as defined by the Appalachian Regional Commission (ARC). Following ARC's definition, every county in the state of West Virginia is considered an Appalachian county.
- 12 [The Protective Value of Nature p. 3](#)
- 13 [The Protective Value of Nature](#)
- 14 [West Virginia - State Climate Summaries 2022](#)
- 15 [The Protective Value of Nature](#)
- 16 [Repairing the Damage: Cleaning up the land, air, and water damaged by the coal industry before 1977](#)
- 17 https://appvoices.org/resources/RepairingTheDamage_ReclamationAtModernMines.pdf
- 18 <https://www.nrdc.org/sites/default/files/climate-ready-soil-IB.pdf>
- 19 [Climate-Ready Soil: How Cover Crops Can Make Farms More Resilient to Extreme Weather Risks](#)
- 20 [Repairing the Damage: Cleaning up the land, air, and water damaged by the coal industry before 1977](#)
- 21 [Ohio funding will help connect those recovering from substance use disorders to jobs | The Statehouse News Bureau](#)
- 22 [ARC Awards Nearly \\$14 Million to 43 Projects Supporting Appalachians Recovering from Substance Use Disorder](#)
- 23 [Workforce Opportunity for Rural Communities - Appalachian Regional Commission](#)
- 24 [On-ramps to Construction Careers in Appalachia, our report co-released with the Keystone Research Center, offers more in-depth information about this issue.](#)
- 25 [Bipartisan Infrastructure Law Guidance FY 2022](#)
- 26 [Bipartisan Infrastructure Law Guidance FY 2022](#)
- 27 For more detail on these programs and some data related to apprenticeship in PA, OH, WV, and KY, see [On Ramps to Construction Careers in Appalachia](#).
- 28 For profiles of the Columbus "Building Futures" pre-apprenticeship program, "Intro to the Trades" in Pittsburgh, and "Kentuckiana Builds" in Louisville, see Polson et al., "On Ramps to Construction Careers." These programs are part of a national movement to build pathways for people of color, women, and returning citizens into union construction careers. On this movement, and for a profile of 20 pathways to union construction careers, see Cihan Bilginsoy et al., "Diversity, Equity, and Inclusion Initiatives in the Construction Trades," ICERES (the Institute for Construction Employment Research), March 2022; <https://nabtu.org/wp-content/uploads/2023/01/ICERES-Study-22Diversity-Equity-and-Inclusion-Initiatives-in-the-Construction-Trades22.pdf>.
- 29 <https://www.osmre.gov/sites/default/files/inline-files/FY%202016%20-%20FY%202022%20Abandoned%20Mine%20Land%20Economic%20Revitalization%20Program%20Report.pdf>
- 30 https://www.youtube.com/watch?v=AK2_ArIWymQ
- 31 [Abandoned Ohio coal mines leave holes in the landscape and the economy. A government program aims to fill them](#)
- 32 [Abandoned Mine Land Economic Revitalization \(AMLER\) Program | Ohio Department of Natural Resources](#)
- 33 Miller, Andrew J., et al. [Mountaintop Removal Mining and Catchment Hydrology](#). 2014
- 34 <https://www.osmre.gov/programs/arri>
- 35 <https://www.grants.gov/search-results-detail/350363>
- 36 [FACT SHEET: Biden-Harris Administration Announces American Climate Corps Listening Sessions, New Actions to Mobilize the Next Generation of Clean Energy, Conservation, and Resilience Workers | The White House](#)
- 37 [Urban and Community Forestry Program | US Forest Service](#)
- 38 [Rising Appalachia to foster sustainable forest-based businesses – Athens County Independent](#)
- 39 [Mahoning Valley TreeCorps | Youngstown Neighborhood Development Corporation](#)
- 40 [Nature-Based Solutions Resource Guide 2.0 | The White House](#)
- 41 For more on the case for a large CCC, see Ted Boettner and Stephen Herzenberg, "A Big Civilian Climate Corps is Vital for the Economy and Appalachia," Ohio River Valley Institute, Keystone Research Center and ReImagine Appalachia, September 2021; https://ohiorivervalleyinstitute.org/wp-content/uploads/2021/09/CCCBrief_FullText-3.pdf.