

Promoting Climate Change Havens in the United States and Globally for Migrating Populations

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Abstract

Appalachia has been identified as the largest Climate Change Haven in the continental United States and could serve as a refuge for millions of persons. This research presents a marketing plan for promoting migration to the Appalachian Region using advertising and a website that communicates the desirable qualities of the area. Communications will first be directed toward the current residents of Appalachia (the Internal Market) in order to create enthusiasm for welcoming new arrivals. Then, promotional messages will be sent to prospective migrants seeking to escape the negative effects of climate change in the Southeast and Southwest of the United States and globally (the External Market). The approach used here may be applicable to Climate Change Havens across the globe.

Keywords

Climate Change Havens, Appalachia, Climate Change Migration, Economic Rejuvenation, Promotional Websites

1. Introduction

Within the next two decades much of the human population living in North Africa, Australia, the Middle East, Southern India, around the Mediterranean and in the Southeastern and Southwestern portions of the United States will find it necessary to move to safer regions or perish (climate.nasa.gov/effects). While there has been an abundance of research conducted globally documenting the pervasive reach and destructive force of climate change [1] and human migration caused by it [2], there has been very little effort to actually prepare appropriate regions of the globe to re-settle the millions of persons anticipated to mi-

grate there.

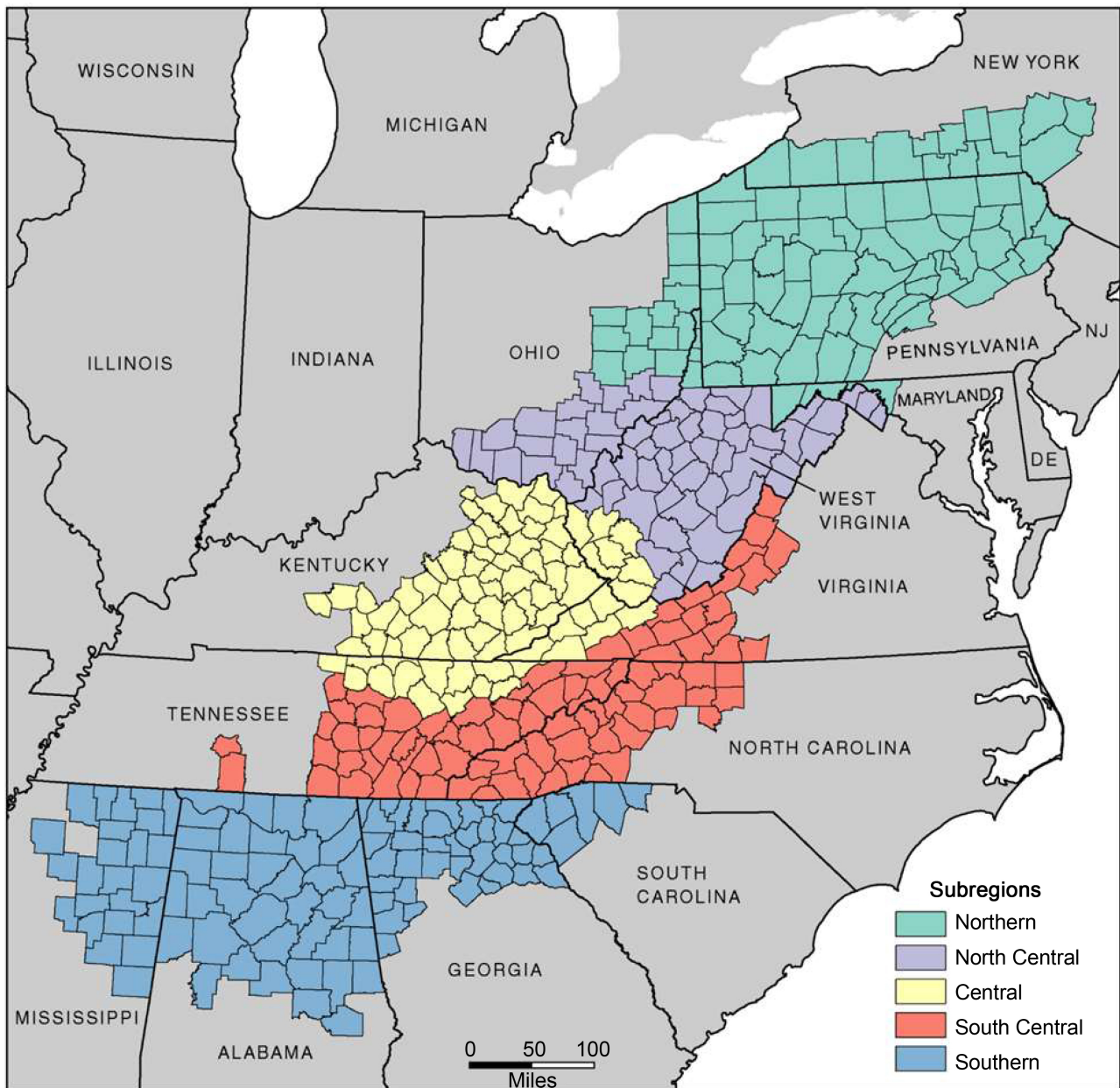
The present research focuses upon a key region of the United States identified as a *Climate Change Haven*, that is, *an area where towns of 20,000 to 30,000 persons can be established in an environmentally safe location* [3]. There are believed to be three such areas in the Continental United States: Appalachia, the interior of New England, and the Upper Great Lakes Region. Of these, Appalachia comprises the largest land area (climate.nasa.gov/effects). Portions of Alaska also may serve as a Climate Change Haven, but because Alaska lies outside the border of the United States, new residents will have to travel through Canada in order to live or work there (climate.nasa.gov/effects).

Appalachia is not only the largest refuge area in the US, it is also one which would dramatically benefit by an in-flow of population, especially families and persons having skilled labor and technological expertise; this is because there has been a dramatic outflow of population from Appalachia over the past two decades, with many of the younger persons leaving for higher-paying jobs in urban areas [4]. This “brain and labor” drain represents a trend the region would very much like to reverse. By building Climate Change Haven Communities, Appalachia will not only be able to assist migrating persons and families, it will also re-construct its economy and improve its educational, medical, recreational and cultural resources.

Our present purpose is to discuss the development of websites, advertisements and community outreach programs that can be used to promote the development of Climate Change Havens in the United States, with a primary focus on the Appalachian Region. It is vital that persons currently living in areas to which climate migrants are traveling be prepared to welcome these incoming persons and that appropriate accommodations are in place to receive them when they arrive. The proposed model uses on-line, newspaper and radio communications to encourage current residents to accept the new arrivals and prepare housing, recreational, medical and business facilities where they can live and work. This promotional model can be extended to other Climate Change Haven locales in the United States, and portions of the model may be applicable to Climate Change Haven sites in Scandinavia, Scotland, Greenland, Germany and Austria.

The map in **Figure 1** depicts the current county structure of Appalachia. The Appalachia Region Climate Change Haven Plan does not include counties in New York State, and the southern states of Mississippi, Alabama, Georgia, South Carolina and the lower portions of Tennessee. This is because these southern-most Appalachian counties will likely become too hot to sustain Climate Change Haven Communities, and the Appalachian counties in New York State are better positioned to participate in Climate Change Haven development plans created for New England.

The marketing plan uses three counties in Southwest Virginia, Wise, Dickenson and Russell, to illustrate of the content of promotion deemed appropriate to attract migrant in-flow from areas of the United States most susceptible to



Map by: Appalachian Regional Commission, November 2009.

Figure 1. A map of the entire Appalachian region.

climate change, especially the Southeastern and Southwestern regions of the country. These three counties were chosen due to their “typicality” of conditions across Appalachia. As will be discussed below, one county (Wise) has been heavily surface-mined and will require extensive remediation prior to becoming a Climate Change Haven. A second county (Dickenson) has moderate levels of surface mining, but experiences frequent flooding, due to increased rainfall and steep terrain; it will require the placement of flood-control dams on key waterways. The third county (Russell) has little surface mining and does not often experience flooding; it will require very few alterations before Climate Change

Haven Communities can be constructed.

Because of their topographical differences, these counties can serve as useful models for establishing Climate Change Haven communities throughout Appalachia and in analogous regions globally. Indeed, surface mining and flash flooding due to run-off are relatively common in those regions of the world which will be able to serve as Climate Change Havens, e.g., Scotland, Scandinavia and Germany.

Promotional materials directed toward current residents and potential in-coming migrants will be adapted to the surface terrain conditions found in each county. This procedure will be expanded to the 15 counties of Southwest Virginia and ultimately to Appalachia as a whole. In its final stage, the promotional effort will include counties in Eastern Kentucky, Western Pennsylvania, Southeastern Ohio, Northeast Tennessee, Western North Carolina and the entire state of West Virginia.

The Appalachia Climate Change Haven Development Plan is based on substituting hydro-power electrical systems for the coal-fired plants now in use in that region, together with biofuel combustion provided by switchgrass [3]. Because of the need to accommodate terrain differences, our promotional focus is upon intra-county development, rather than state-level development, with West Virginia being the exception. (Because every county in West Virginia has been surface mined, it is likely that the residents there will choose to use a state-wide development model, since that would be more efficient). To assure that current residents are supportive of transforming their counties into Climate Change Havens and welcoming incoming migrants, the first task of the marketing effort will be to promote the economic and cultural benefits of constructing Climate Change Haven communities to the current residents.

The cooperation of county governments will be solicited in helping design promotional messages and supporting construction of the Climate Change Haven Website. They will be asked to contribute photographs, population and economic data, historical records, and any other information they believe will communicate the desirability of their county to potential in-coming residents. This will enable local governments to have a direct role in creating their county's image and in targeting the types of new residents, services and businesses they would like to attract to their county. County-level commitment and cooperation is essential to the success of transforming the Appalachian Region into a Climate Change Haven. Efforts by "outsiders" to impose an external structure on a given county will likely be doomed to failure, due to the strong belief in self-governance found throughout the Region.

2. The Initial Model

College students and residents from three counties in Southwest Virginia were surveyed about the current lifestyle in their county and to provide a sense of local values and beliefs. Most saw themselves and their towns as "friendly" and

“self-sufficient”. However, they expressed concern about the decline in population that has been occurring throughout Appalachia and the subsequent loss of businesses, schools and jobs over the past several decades. Much of this decline is due to phasing out of the coal-mining industry in order to protect the Region from climate deterioration. Several thought they or their children would have to “go somewhere else” in order to get a good job. Thus, the possibility of attracting new residents by erecting Climate Change Haven Communities was seen as a very desirable activity by most current residents.

All of those interviewed were aware of climate change occurring within the United States and across the world, but most believed “not much has been happening here” except for the increased incidence and severity of flooding. When asked if they would welcome new residents who were seeking to move from various climate-affected areas of the country, they were open to the idea; however they expressed concern that persons from New York City and the Northeast might not be “friendly”. For this reason, the researchers decided to restrict future external population marketing efforts to the Southeast and Southwestern areas of the US. Both in the United States and globally, it will be important to insure that potential in-coming climate migrants are welcomed by those already living in Climate Change Haven regions and gaining the support of the existing population in advance is vital to this outcome (see e.g., [5]-[17]).

Next, a “Story of Appalachia” narrative was developed for the promotional website. This was done to help build pride in the Appalachian Region among current residents, especially younger members who may have been thinking of moving elsewhere in search of better career opportunities. The narrative is also designed to make the Region attractive to the types of persons the current residents would like to attract as Climate Change Haven Migrants. This section of the website is shown below:

3. Appalachia the Original American Paradise ... Now a Climate Change Haven

“About 16,000 years ago the first Native Americans arrived in Appalachia. They found the land rich with wild game, flowing waters and splendid forests. In the streams and rivers there were otters, mink, trout, bass, and mussels which produced lustrous pearls. The Appalachian woodlands and meadows were home to the greatest variety of plant species, trees, shrubs, grasses, in North America. Several of the Native tribes made Appalachia their home. By the mid-1550s Spanish explorers arrived and began trading with these Native peoples, providing them with horses which greatly increased mobility throughout the Region” (see **Figure 2**).

In the early 1700s British Colonial settlers entered Appalachia, establishing a series of frontier forts that stretched along the major rivers. These are depicted in **Figure 3**.

In 1775 explorer Daniel Boone led the first settlers through the Cumberland



Figure 2. Native Americans with horses.



Figure 3. A frontier Appalachian fort.

Gap and described what he found there as “the Promised Land”, because it was so abundant with wild game, fresh streams, and bountiful forests. A painting of this is shown in **Figure 4**.

During the mid-1800s, rich coal deposits were discovered throughout Appalachia. Mining operations began, and the coal produced in Appalachia helped create the Golden Age economic boom in the United States. The nation’s first millionaires, Carnegie, Frick, Morgan, Rockefeller, Vanderbilt, all benefitted from the Appalachian Coal Boom and the subsequent establishment of railroads



Figure 4. Daniel Boone leads settlers through the Cumberland gap.

and steel mills. By the early 1900s, the United States became the wealthiest country on Earth. An early coal mine operation is shown in **Figure 5**.

Today, coal production is but a small part of the Appalachian economy, which has diversified to include techno-information services, eco-tourism, eco-agriculture, and pharmaceutical experimentation with our medicinal plants and animal species. And Appalachia remains the most ecologically diverse region of the Continental United States. A current view of the Region is shown in **Figure 6**.

But of greatest importance for all of us is the discovery by climate change scientists and global ecologists that the Appalachian Region will become the largest habitable area in the Continental United States by 2030. So if you value your and your children's quality of life, the quality of life of your employees, and your quality of life in retirement move to the Climate Change Haven of Appalachia!

By emphasizing the diverse ethnic history, Native, Spanish, British, of Appalachia, the promotional narrative is intended to position the Region as a welcoming Climate Change Haven for persons of varied backgrounds who will be seeking to move from their drought-stricken and/or storm damaged homes to a place of greater safety, one which will welcome their arrival.

Radio and Newspaper Announcements

In addition to creating the promotional website, a series of 60 second radio and full-page newspaper advertisements were developed to alert Appalachian residents of the opportunity to transform their Region into a Climate Change Haven. These feature potential sites in each Appalachian county for the construction of 20,000 to 30,000-person walkable communities powered by hydro-power

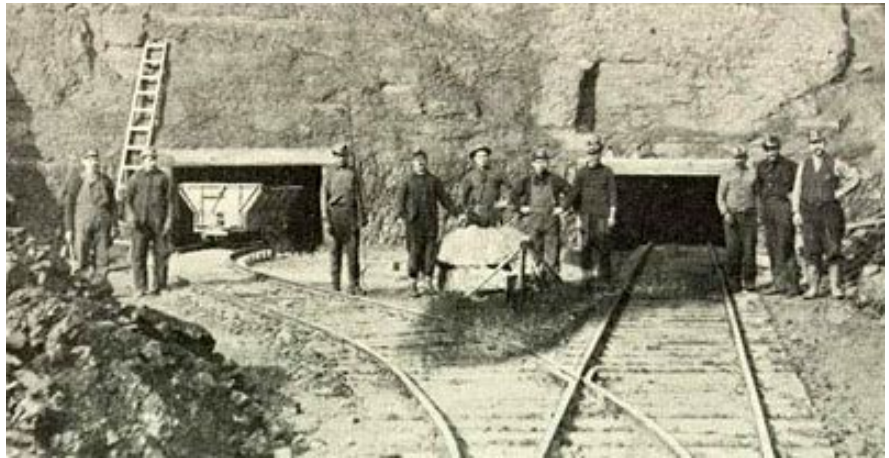


Figure 5. Miners at an early Appalachian mine.



Figure 6. Current view of Appalachia.

electric generators [3]. The generators will be placed on local rivers and reservoirs and replace the coal-fired furnaces now in use. This will greatly reduce residents' electricity costs and eliminate the pollution produced by burning coal. It will also enable each county in Appalachia to sell their excess electricity to external markets, generating funds for community development and lowering taxes.

Images of eco-housing developments, recreational facilities and potential in-coming businesses are featured in the newspaper advertising for each Appalachian county to show how their communities can be improved by becoming Climate Change Haven locales. In both types of advertising, emphasis is placed on the importance of their community preferences and their county government input in designing the Climate Change Haven communities. Copies of the newspaper advertisements and radio commercial scripts will be featured on the

promotional website and updated as new migrant residents and businesses arrive.

4. Three Model Climate Change Haven Towns

Following the “Story of Appalachia” Narrative, the next section of the promotional website features three model Climate Change Haven towns; these model towns were developed for sites in Wise, Dickenson and Russell counties in Southwest Virginia. As noted earlier, these three counties were chosen to demonstrate how varying levels of surface-mined land can be transformed into Climate Change Haven Communities by restoring the mined areas to habitable sites. These counties are also used to show how the installation of new flood control dams can eliminate the tendency of increased heavy rainfall (due to climate change) to cause flash flooding in low-lying areas. This section of the website shows the proposed placement of hydro-power electric generators on rivers and reservoirs to provide electricity to the county and its existing and newly arrived residents and businesses.

Once the initial building sites and flood control preparations for each county are completed, residents will be asked to choose the types of housing, administrative, educational and medical facilities they would like to see constructed in their new Climate Change Haven Communities. Possible choices for these structures are shown below, along with potential contractors who are highly-rated eco-builders. Because qualified builders are already available, the construction time for creating a new Climate Change Haven Community is estimated to be approximately three to seven years. Because climate change is now forecast to be more rapid than previously predicted, it is essential that sites be identified and preparations begin immediately.

4.1. Residential, Business and Recreational Options

Several potential designs for residential, recreational and business structures were shown to residents in each of the three Appalachian counties in order to gain feedback on their preferences and desired locations. Some of the highly rated designs are shown below. These will be featured on the promotional website and in newspaper advertising. Additional comments and preferences will be sought from current and potential residents.

Shown in **Figure 7** is an eco-design for an in-town residential building. This could be appropriate for incoming families, couples, and single persons. Local residents may choose to live here, as well. This structure uses plants and solar windows to moderate heating and cooling costs; it will be powered by hydro-powered electrical generators. In-town residential buildings will be located along electric bus routes for easy access to work, schools, recreation, medical services and administrative services.

Shown in **Figure 8** are positively-rated images of higher density apartment complexes for both incoming and current residents which will be featured



Figure 7. Shown above is an eco-design residential building.



Figure 8. Shown above is a high-density apartment complex for incoming residents.

on the promotional website. These images were shown to a diverse set of persons already living in the three “model” Appalachian counties and found to be attractive to them. Each building will be powered by the community’s hydro-electric generators and be fitted with eco-glass windows to reduce electricity costs. They will be located adjacent to the electric bus route to provide easy access to town services and businesses. A listing of qualified eco-construction companies is given in Appendix One. Current residents will select specific companies to present proposals for developing Climate Change Haven Communities in their county.

4.2. Marketing Efforts to Attract Desirable Companies to Climate Change Haven Communities

Working with residents and government officials in each Appalachian county, marketing efforts will be made through the Appalachian Climate Change Haven Website and targeted corporate communications to attract medium and large service companies to relocate to specific counties. Counties will need to identify companies they wish to attract in advance and send them marketing materials emphasizing that specific county's advantages over the companies' current locations in, say, Arizona, California, Georgia or Texas.

In particular, companies which specialize in technology, communications, insurance, financial services, medical research and pharmaceuticals would find the Climate Change Haven Communities of Appalachia very desirable, due to their centralized location, Eastern time zone, and accessibility to European, Canadian and South American markets. Residential areas, new schools, medical services and recreational facilities can be purpose-built to accommodate large incoming companies, while clusters of start-up technology or medical research companies could be located in purpose-built facilities. Because many of these newly-arriving companies will have high-income earners as a part of their work force, residential designs that offer both ecological-construction and high-end finishes can be constructed on sites adjacent to the electric bus lines.

Shown above in **Figure 9** is an ecologically-designed up-scale residence which fits nicely into the Appalachian hillside. This residence uses solar pane windows and will be powered by hydro-electric generators at a low cost. (For a listing of qualified green-contractors and designers see **Appendix One**.)

Shown above in **Figure 10** is a tiered eco-structure which can function as a mixed-use development for rental units, businesses and medical services. This type of configuration is designed to fit into the Appalachian hillside terrain and



Figure 9. An ecologically-designed hillside house.



Figure 10. Tiered multi-use eco-structure.

will minimize travel time (Engineering News Record, Eco-Contractors). These also would be located on the electric bus line, providing employees, residents and visitors easy access without driving. The promotional website will feature several such structures to provide potential in-migrating companies an idea of the types of facilities that can be constructed in the Appalachian Climate Change Haven Communities.

Shown above in **Figure 11** and **Figure 12** are sports and playground facilities for both adults and children that can be utilized in the new Climate Change Haven Communities in Appalachia. These will be located within easy walking distance of housing complexes and also have stops for the electric buses. These images – and others demonstrating a diverse array of recreational facilities, will be featured on the Climate Change Haven Community website. Companies that decide to re-locate their operations to an Appalachian Climate Change Haven Community will have the opportunity to select and design these new facilities, along with the current residents.

An Example of Newspaper Advertising The sample newspaper advertisement below was prepared for Dickenson County in Southwest Virginia. It will be placed in the primary county newspaper concurrent with the launch of the promotional website. A copy of the advertisement will also be displayed on the promotional website in the Dickenson County section. This will create repetition of the central message put forward by each county and help create enthusiasm among current residents for transforming their county into a Climate Change Haven Community.

“Climate change is badly damaging the Southeast and Southwestern regions here in the United States. But climate scientists believe that our area of Appalachia will remain largely unharmed by its effects. This means that we can become a Climate Change Haven for Americans who now live in the South and West.



Figure 11. An exercise area for adults.



Figure 12. Eco-playground facility for children using natural and recycled materials.

The people who live there will need to move here by 2030, if they want to save their jobs, businesses and future. Here in Dickenson County we can welcome these newcomers and the prosperity they will bring by becoming THE place for them to live in Appalachia!

*Our two towns of Haysi and Clintwood will be expanded to around 25,000 to 30,000 persons. Electricity will be supplied by new hydro-power electric generators placed on the John Flanagan Reservoir. This generator will create cleaner and lower cost electricity than what we are now using. **And it will be owned and operated by our county.** So our community will benefit, not the coal companies. To find out more about these exciting changes and how you can help, just look on our website <https://www.climatechangehaven.com/>.*

“As you already know, our Appalachian hospitality here in Dickenson County is like no other. As we become one of the only Climate Change Havens in the Continental US, we will have the best future for you and your family.”

The two photographs below in **Figure 13** and **Figure 14** show the current



Figure 13. View of Clintwood, Virginia.



Figure 14. Current residents of Clintwood, Virginia.

town of Clintwood in Dickenson County and a set of current residents.

Note that the newspaper announcement emphasizes the fact that incoming climate change residents will be from areas of the United States which those already living in Appalachia will find to be compatible with their own values and lifestyles.

4.3. Radio Commercial for Wise County

The radio commercial below was prepared for the current residents of Wise County, VA, one of the three example counties used in our research. It will be carried on the main radio station in the county.

Good afternoon Wise County! As you probably heard, climate change is making its way across our country, causing many Americans in the South and Southwest to lose their homes, jobs, businesses and even entire towns. Many areas out West are becoming too hot and dry for people to live there. And other

places along the Southern coast are being flooded every year.

But fortunately for us, Wise County will not be very affected by climate change, because here in the Appalachian Mountains we are protected from most of the bad weather that is happening in other places. In fact, climate scientists believe Appalachia is going to be the safest area to live in the United States by 2030!

We are what is called a Climate Change Haven and many folks from the Southeast and Southwest will need to move here to live in the next few years. They will be bringing their companies, special talents, and families with them, which will bring prosperity to Appalachia and our county. We need to be ready to welcome them by building some new towns and expanding our existing ones. All our towns will be powered by hydro-power electric generators placed on our many rivers and lakes. This will provide clean, less-expensive electricity for all of Wise County. The new companies coming here will also mean more high-paying jobs, expanded health and dental care, new schools and new community entertainment and recreational areas. For more information on what will be happening and how you can help please visit <http://www.climatechangehaven.com/> and look under “Wise County”.

5. Closing Discussion

This study has focused on re-locating migrating persons within the Southern and Western portions of the United States to Climate Change Haven areas in Appalachia and preparing the current residents there to welcome them. Doubtless there are many other persons from the countries south of the United States who would like to migrate to Appalachia as well. However, the current political environment in the United States is often hostile to migrants from Central and South America, who are presented in some media outlets as dangerous and impoverished (see e.g., Migrant encounters rise above 180K in May as ... Fox News, <https://www.foxnews.com/politics/migrant-encounters-may-border-crisis-continues-cbp-data-show>). While this is an incorrect portrayal, it is vital for climate change migrants to identify regions of the world which would welcome their arrival. By using outreach communications programs such as the one described in this study, various global Climate Change Haven locations can send positive messages to those persons whose in-migration they would welcome and simultaneously prepare their current residents to welcome these newcomers. Such “pre-matching” actions will likely produce much more positive migration outcomes than those often experienced at present (see e.g., [5]-[17]).

6. The Preliminary Climate Change Haven Website

After conferring again with current residents in the three initial counties, our preliminary website was constructed. The opening screenshot is shown below in **Figure 15**. It contains cost and time projections where possible. After additional vetting by administrators in the three counties, the website will make its public debut on-line.

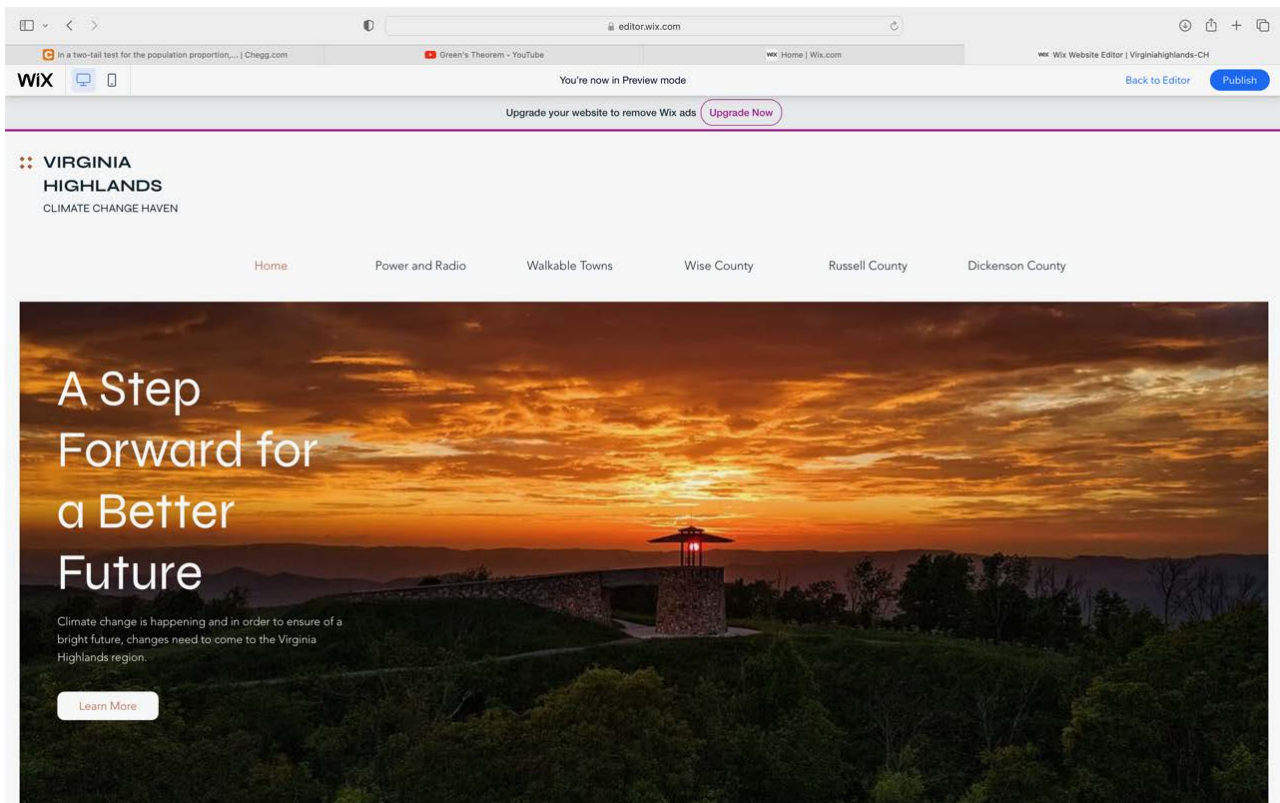


Figure 15. Website Opening Scene.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix One: Leading Ecological Builders in United States

Engineering News Record Listing of Top Green Construction Companies in 2022 (accessed May 30, 2023). Companies are ranked by construction revenue in 2019 in (\$US) millions. Those with subsidiaries (†) are listed by company rank, which may be found on the Engineering News Record website at <https://www.enr.com/>.

RANK 2022	RANK 2021	FIRM
1	1	The Turner Corp., New York, N.Y.
2	2	Bechtel, Reston, Va.†
3	4	Kiewit Corp., Omaha, Neb.†
4	6	STO Building Group Inc., New York, N.Y.†
5	3	Fluor, Irving, Texas†
6	5	The Whiting-Turner Contracting Co., Baltimore, Md.
7	10	DPR Construction, Redwood City, Calif.
8	9	Skanska USA, New York, N.Y.†
9	13	Clark Group, Bethesda, Md.†
10	8	AECOM, Dallas, Texas
11	11	Gilbane Building Co., Providence, R.I.†
12	14	PCL Construction, Denver, Colo.†
13	7	Tutor Perini Corp., Sylmar, Calif.†
14	12	Hensel Phelps, Greeley, Colo.
15	15	The Walsh Group, Chicago, Ill.
16	24	Clayco, Chicago, Ill.†
17	20	JE Dunn Construction Group, Kansas City, Mo.
18	21	Holder Construction, Atlanta, Ga.
19	18	Mortenson, Minneapolis, Minn.†
20	16	Balfour Beatty US, Dallas, Texas†

Appendix Two: Resources for Climate Change Haven Communities

Climate change: How expensive is renewable energy? | World...

<https://www.un.org/en/climatechange/raising-ambition/renewable-energy>

Dam Safety|FEMA.gov

<https://www.fema.gov/emergency-managers/risk-management/dam-safety/federal-guidelines>

Designing Activity-Friendly Communities|DNPAO|CDC

<https://www.cdc.gov/nccdcphp/dnpao/features/walk-friendly-communities/index.html>

EcoProperty People and Property Everywhere on Sustainability

<https://ecoproperty.com/>

Engineering News Record, ENR Top 100 Building Contractors, September 2019, accessed online May 30, 2023

Green Power Pricing|US EPA

<https://www.epa.gov/green-power-markets/green-power-pricing>

Guide to Sustainable Real Estate Development - FortuneBuilders

<https://www.fortunebuilders.com/sustainable-real-estate...>

How Hydropower Works|Department of Energy

<https://www.energy.gov/eere/water/how-hydropower-works>

Hydropower Basics|Department of Energy

<https://www.energy.gov/eere/water/hydropower-basics>

Hydroelectric Power: How it Works|U.S. Geological Survey

<https://www.usgs.gov/special-topics/water-science-school/...>

Hydroelectric Energy - National Geographic Society

<https://www.nationalgeographic.org/.../hydroelectric-energy>

Increased Importance Of Environmental Sustainability

<https://www.forbes.com/sites/forbesrealestatecouncil/..>

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Large Hydro Generators|GE Renewable Energy - General Electric

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