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Tourism aspects in the Appalachian Geopark Project in West Virginia, USA: Preliminary Notes

Aspectos do turismo no Projeto do Geoparque Appalachian, West Virginia, EUA: notas Preliminares

Aspectos del turismo en el Proyecto Appalachian Geopark, Virginia Occidental, EE.UU.: notas preliminares

Robert Clyde Burns
robert.burns@mail.wvu.edu
West Virginia University, WVU, Morgantown, EUA

Jasmine Cardozo Moreira
jasminecardozo@gmail.com
Universidade Estadual de Ponta Grossa, UEPG, Ponta Grossa, PR

Abstract: The Appalachian Geopark (AG) Project is situated in three southern West Virginia (WV, USA) counties: Fayette, Greenbrier and Raleigh. They include the components of rivers, caves, and coal; as well as transportation modes, including rail, and country roads. Perhaps most importantly, AG includes the heritage of the people living in the Appalachians. West Virginia University is the entity responsible for developing AG and will hand over the leadership to local grassroots entities. With this project, the Geopark concept can be linked to a revitalization effort in southern WV, offer new opportunities to develop the communities, and forge a sustainable future. A preliminary inventory exposes nearly 100 geosites. The objective of this paper is to present some of the geosites and discuss future desired conditions. There are no Geoparks in the United States, and Appalachian Geopark is proposed to fill this gap.

Keywords: Appalachian Geopark, Geosites.

Resumo: O Projeto Geoparque Appalachian (AG) está situado em três condados do sul da Virgínia Ocidental (WV, EUA): Fayette, Greenbrier e Raleigh. Eles incluem rios, cavernas e carvão; bem como modos de transporte, ferrovias e estradas rurais. A área do Geoparque inclui a cultura das pessoas que vivem nas montanhas Apalaches. A West Virginia University é a entidade responsável pelo desenvolvimento do AG e entregará a liderança a entidades locais. Com este projeto, o conceito de Geoparque pode auxiliar na revitalização do sul de WV, oferecer novas oportunidades para desenvolver as comunidades em busca deum futuro sustentável. Um inventário preliminar revelou quase 100 geossítios. O objetivo deste artigo é apresentar alguns desses geossítios e discutir futuras condições. Não há Geoparques nos Estados Unidos e o Geoparque Appalachian é proposto para preencher essa lacuna.

Palavras-chave: Geoparque Appalachian, Geosítios.

Resumen: El proyecto Appalachian Geopark (AG) se encuentra en tres condados del sur de Virginia Occidental (WV, EE.UU.): Fayette, Greenbrier y Raleigh. Incluyen ríos, cuevas y carbón; así como los ferrocarriles y caminos rurales. AG incluye la cultura de las personas que viven en los Apalaches. West Virginia University es la entidad

responsable del desarrollo de AG y entregará el liderazgo a entidades locales. Con este proyecto, el concepto Geopark se puede vincular a un esfuerzo de revitalización en el sur de WV, ofrecer nuevas oportunidades para desarrollar las comunidades y un futuro sostenible. Un inventario preliminar expone cerca de 100. El objetivo de este artículo es presentar algunos de los geositios y discutir las condiciones futuras deseadas. No hay Geoparques en los Estados Unidos, y se propone el Appalachian Geopark para llenar este vacío.

Palabras clave: Appalachian Geopark, Geosítios.

INTRODUCTION

The Appalachian Geopark was proposed as a United States' Geopark in 2015. While the Geopark concept is relatively new worldwide, there are 140 Geoparks in 38 countries around the world, including three in Canada and two in Mexico.

The United States clearly possesses areas that would be appropriate for Geopark status, and a prime candidate is the Appalachian region of southern West Virginia (WV). The Appalachian region has deep gorges and ancient rivers that drove the rise of the US industrial revolution of the late 1800s—primarily through coal, timber, and from the waters of the many rivers that mark the landscape. The southern WV coal mining communities produced the fuel that transformed rural America into an industrial power. The AG area includes an exhibition coalmine and National Park Service coal mining exhibits and communities. There are also heritage aspects linked with railroad, historical and military history, rural communities, WV State Parks and US National Forests. Recreation opportunities include innumerous trails, biking, climbing, birdwatching activities, and some of the best and most notorious whitewater rapids in the world.

Locally produced and coal related geoproducts, including "coal candy" and "coal jewelry" can be found at the Tamarack, a showcase of Appalachian arts and crafts. Tourism in the area is well developed and the proposed setting is strategically located. Over 60% of the US population and virtually all major cities in the eastern half of the US is within a day's drive on a high quality road network.

The Appalachian Geopark Project synthesizes the existing National, State, and local parks and forests of southern West Virginia under one umbrella**.** Includes critical touristic landmarks (called geosites), embracing: New River Gorge, Gauley River, historic monuments, springs, karst, caves, Thurmond, rail heritage, coal heritage, Greenbrier River Trail, water and geological formations of international significance, WVU Beckley campus, Bechtel Summit, WV State Parks/Forests, and more.

There are many reasons to create a Geopark in West Virginia. Among them:

- to stimulate much needed economic development in the region;
- to further develop and enrich the surrounding communities through this innovative and contemporary opportunity;

- to elevate the state's geology, coal heritage, rail heritage, caverns and caves, springs, historic structures, the New River Gorge, the Gauley River, Thurmond, and many more landmarks that help define West Virginia;
- to continue the close collaboration with the U.S. Geological Survey (USGS); to further elevate the state within the region, the nation and beyond.

That said the primary reason for developing the AG is that it will be linked to a revitalization effort in southern WV, offer new opportunities to develop the communities, and forge a sustainable future. Coal heritage, one of the unifying themes of the AG, comes at an economic cost. In other words, there is now little economic impact from the coal economy, when coal used to be the primary economic driver in the state of West Virginia. The loss of coal mining jobs makes it necessary to find alternative approaches to revive WV economy and to fill the employment and revenue gaps left behind by the coal mining (LONGWOODS INTERNATIONAL, 2016).

Communities in southern West Virginia have seen a drastic decrease (45%) in coal-related jobs during the 2005-2015 period (HODGE, 2016). This is particularly true in recent years. From 2011 to 2015, the US lost 26,432 coal-mining jobs, 87% of which were in Appalachia (HODGE, 2016). West Virginia and Kentucky combined lost over 16,000 coal-mining jobs (including more than 8,000 in West Virginia alone) over the same period, accounting for 70% of the total loss of 23,058 jobs in the entire Appalachian Region during that period (WV WORK FORCE, 2018). Bowen et al. (2018) classified Appalachian counties in three categories: vulnerable (at risk to lose coal-related jobs if further coal activities shut down), hardship (suffered job losses from coal activities, but not at risk from further job losses) and depressed (both suffered job losses and still at risk from further job losses). Clearly, the area around the AG is considered as depressed.

Since the late 1970's tourism, as an asset-based economic development strategy, has been regarded as an effective economic development tool for rural America (GARTNER, 2004). Tourism equates to employment, and particularly to rural employment. In 2011, travel and tourism in America grew by 3.5%, which is more than twice the rate of growth for the overall US economy. A Current Travel Index (CTI) (US TRAVEL ASSOCIATION, 2017) indicates that travel to or within the US grew by 3.2% from May 2016 to May 2017. Travel spending in West Virginia has increased by 5.8% between 2000 and 2012, faster than the national average (although the state has seen an overall decline since 2012). In addition, tourism is a major economic sector in the state—in the range of 4—5 billion visitor spending and approximately 45,000 jobs in 2016 (DEAN RUNYAN ASSOCIATES, 2017; LONGWOODS INTERNATIONAL, 2016).

In 2012, the US set a goal of attracting 100 million international visitors with an estimated spending of $250 billion annually by the end of 2021. This provides both opportunities and challenges for rural America as most international visitors choose to visit large urban centers rather than rural areas. Thus, each state in Appalachia needs to develop approaches to attract not only urban residents from within and beyond the state, but also international visitors. The importance of attracting international tourists to rural

America is also noted from the Travel Promotion Act, ''identifying strategies to promote travel to rural and urban areas equally, including the areas not traditionally visited by international travelers'' (US TRAVEL AND TOURISM ADVISORY BOARD, 2011).

The rural authenticity, unique culture and heritage, distinctive and "alive" assets of traditional music, art and craft, local food and drink, and outdoor beauty and recreation have been increasingly identified as important assets that can help to improve local economies by attracting visitors if effectively developed and promoted. Cultural-heritage tourism is one of the fastest growing niche tourism markets. According to Mandala Research (2013), 76% of all US leisure travelers can be defined as cultural-heritage travelers, having participated in cultural-heritage activities on their most recent trip(s) or within the past three years, with an average annual spending of $171 billion. Cultural-heritage tourists in the US grew from 225 million adults in 2009 to 240 million in 2013. Although they are typically older, more affluent, well educated, and spend more than other types of tourists (MANDALA RESEARCH, 2013), recent research shows that Millennials (18-33 years of age in 2014) are increasingly interested in experiencing cultural and rural authenticity. This finding endorses the decision made by the Division of Tourism to target out of state millennials (ENGLE, 2016).

The Travel Industry Association of reported that at least 55.1 million Americans can be classified as sustainable tourists or geotourists (STOKES, COOK, & DREW, 2003). In addition, this proposed project is a good fit to meet the demands of the increasing geotourism market in the nation, and will make a significant contribution to the regional economy by not only attracting domestic geotourists, but also international visitors. While international visitor profiles in rural America as a whole and West Virginia specifically are not available, it was estimated a total of 6.5 million international trips were made to rural England in 2010, with an estimated 46.5 million nights and about $3 billion in direct spending in (URS, 2010).

GEOPARKS

A Geopark is a single, unified geographical area where sites and landscapes of international geological significance are managed with a holistic concept of education, sustainable development, and conservation (UNESCO, 2016). A Geopark's geological heritage, in concert with all other aspects of the area's natural and cultural heritage, enhances awareness and understanding of key issues facing society. These include using natural resources sustainably and raising awareness of the importance of the area's geology – from both a historical and present-day standpoint. Also a Geopark provides local people with a sense of pride in their region and strengthens their identification with the area.

The creation of jobs and high-quality training courses is probable, as new sources of revenue are generated through geotourism, while the geological resources of the area are protected. While a Global Geopark must demonstrate geological heritage of international significance, the purpose of a Global Geopark is to explore, develop, and celebrate the links between that geological heritage and all other aspects of the area's natural, cultural,

and intangible heritages. The primary aim of a Geopark is to bring enhanced employment opportunities to the people who live there. These opportunities are being created in association with the conservation of the geological heritage of the Geopark (UNESCO, 2016). The establishment of a Geopark stimulates the creation of innovative local enterprises, small business, high-quality training courses, and new jobs through the generation of new revenue sources (e.g. geotourism, geoproducts). This provides supplementary income for the local population and attracts private capital.

STUDY AREA: THE SELECTED COUNTIES: FAYETTE, GREENBRIER AND RALEIGH

The Appalachian Geopark is centrally located in the heart of the Appalachian Mountains in the eastern United States, located within a six-hour drive of two-thirds of the US population. Three counties, Fayetteville, Beckley, and Lewisburg, and numerous smaller communities are included within the boundaries of the Appalachian Geopark. These three counties consist of approximately 6000 square kilometers, with a population of 160,000.

The bedrock for this three-county area of southern West Virginia comprising the Geopark was created during the Silurian, Devonian, Mississippian, and Pennsylvanian geologic time periods. The Alleghenian Orogeny, during the Permian Period (280 to 250 mya) was the major mountain-building event in the formation of the central Appalachian region of West Virginia. Fayette, Raleigh, and most of Greenbrier County lie within the Appalachian Plateaus physiographic province, which is characterized by relatively flat rock formations with very broad gentle folds, except for the presence of several distinct folds and faults on the eastern side of the province (WEST VIRGINIA GEOLOGICAL & ECONOMIC SURVEY, 2017).

The eastern third of Greenbrier County lies within the Valley and Ridge physiographic province, which is characterized by tightly folded and faulted bedrock (WEST VIRGINIA GEOLOGICAL & ECONOMIC SURVEY, 2017). The Mississippian Period (345 to 310 mya) Greenbrier Limestone, also known as The Big Lime, underlies most of Greenbrier County. The wet climate of the central Appalachian Mountains provides the water movement, one of the elements necessary to form many and sizable karst features like caves, sinkholes, and springs. Some of the world's largest caves form here as contact caves, where *The Big Lime* meets the underlying McCrady Shale Formation, including Organ Cave (61.9 km) (STOCKS & SHEARS, 2015).

The contact caves of southern West Virginia are located at the base of the Greenbrier Group, consisting primarily of limestone, where they overlie the soft, mainly insoluble Maccrady Shale along the eastern edge of the Appalachian Plateaus (DASHER, 2000, apud PALMER 2009). The typical contact passage is wide at the top, with a nearly flat ceiling and walls that taper inward toward a narrow trench. The orientation of cave passages in all of the contact caves is unique to the cave, with vadose canyons extending along the dipping shale and with local offsets along faults. Few of these structures have been

detected at the surface, and their effects on groundwater flow are known only to a handful of speleologists (PALMER 2009).

Likewise, thousands of sinkholes create the magnificent karst landscape of rural Greenbrier County (HORTON, SAN JUAN, & STOESER, 2017).

Pennsylvanian period (310 to 280 mya) extensive coal and massive sandstones primarily underlay Fayette and Raleigh counties. The most famous of the renowned coal seams is the Sewell Coal, a very high quality bituminous coal that helped power the US industrial revolution (PEPPERS, 1996). Both aboveground and underground coal mining have shaped the cultural landscape of Fayette and Raleigh counties for nearly two centuries. Coal heritage is a source of pride for the residents, and the country. In the wake of the coal-dominated economy, a changed landscape has given way to new progress. Two examples of development on reclaimed mine lands are The Summit Bechtel Reserve and Burning Rock Adventure Park.

WEST VIRGINIA UNIVERSITY ROLE AND THE GEOPARK PROJECT

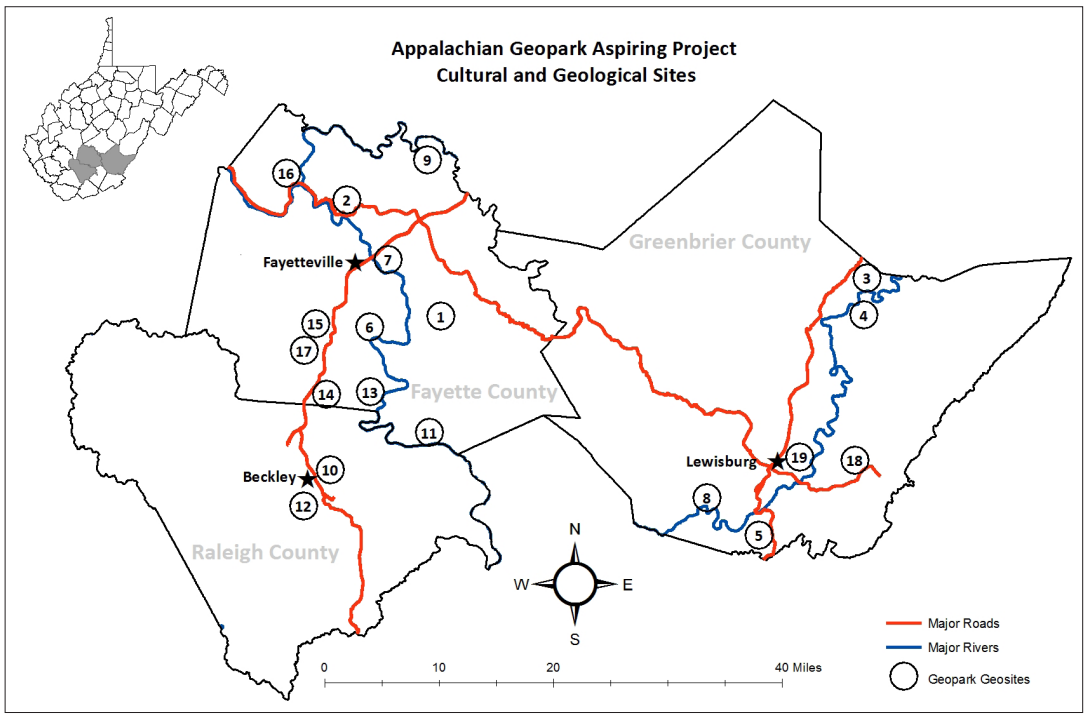
West Virginia University holds steadfast to its mission of delivering high-quality education, excelling in discovery and innovation, modeling a culture of diversity and inclusion, promoting health and vitality, and building pathways for the exchange of knowledge and opportunity between the state, the nation and the world. The scope of the Appalachian Geopark advances the University's land-grant mission, as well as service, collaboration, and economic enrichment of the state. The role of West Virginia University in the AG Project is to initiate progress and secure support from federal/state governments and local citizens before turning it over to a non-governmental entity.

The Appalachian Geopark Project highlights the Appalachian Mountains, focusing on karst, coal, and rivers. The geosites within the Geopark Project display the aboveground and belowground geoheritage of Appalachia. The mountainous region combines a heritage of natural beauty and a distinctive regional culture. European mapmakers of the 1500s erroneously named the mountains for the Apalachee Tribe of northwest Florida. These mountains extend for almost 3,200 kilometers from southwest to northeast in eastern North America. The Appalachian Mountains forms a natural barrier between the eastern Coastal Plain and the vast Interior Lowlands of North America. As a result, they have played a vital role in the settlement and development of the entire continent (DYKEMAN, 2018).

THE PROPOSED GEOSITES

More than 100 geosites were already inventory for the project (Fig. 1). The list includes forests such as the Monongahela National Forest and Greenbrier State Forest, 74 units on National Register of Historic Places, the Appalachian Forest Heritage Area, Little Beaver State Park, Wildlife Management Areas (Plum Orchard and Meadow River Wildlife Management Area), and dozens of caves.

Figure 1. Main Geosites for the Geopark Project. 1. Babcock State Park 2. Hawks Nest State Park 3. Beartown State Park 4. Greenbrier River Trail 5. Organ Cave 6. Thurmond Historic District 7. New River Gorge Bridge 8. Davis Spring 9.Gauley River National Recreation Area 10.Beckley Exhibition Coal Mine 11. New River Gorge National River 12.Tamarack 13.Summit Bechtel Reserve 14.Coal Heritage Park in Mount Hope 15.National Coal Heritage Area 16.Cathedral Falls 17.Whipple Company Store 18.The Greenbrier Hotel 19. Lost World Caverns.



Source: authors.

Babcock State Park

This Park has 4,127 acres, and features the Glade Creek Grist Mill sited on the Quinnimont sandstone of Campbell in the New River Formation. Fully operable, this mill was built as a re-creation of one, which once ground grain on Glade Creek long before Babcock became a state park (WEST VIRGINIA DIVISION OF NATURAL RESOURCES, 2018). This is one of the most famous and photographed spots in the state.

Hawks Nest State Park

Hawks Nest is in the heart of whitewater rafting country, and encompasses 276 acres bordering a rugged section of the New River Gorge National River and known for the panoramic views of the New River and the exceptional geology. Below the state park lodge, the New River forms peaceful Hawks Nest Lake. Above the lake, the narrow canyon and rushing water create one of the most challenging whitewater boating waterways in the nation (WEST VIRGINIA DIVISION OF NATURAL RESOURCES, 2019).

Beartown State Park

This park is located eleven kilometers southwest of Hillsboro. Development of the park has been minimal in order to preserve the natural attractions of the area. However, there are basic facilities, and a boardwalk permits easy access (Fig. 2). Beartown has unusual rock formations, known as a rock city. Rehbein (2016) explains that the rocks are the main attraction. The intersecting crevices resemble streets, and the stone islands look like city blocks.

Figure 2. Boardwalk at Beartown State Park, West Viriginia.

Source: authors

The sandstone bedrock split and eroded along natural joints and fissures creating passageways large enough to walk through. Massive boulders, overhanging cliffs, and deep crevasses stir the imagination of most visitors. Pocketing the face of the cliffs are hundreds of eroded pits, called tafoni, ranging from the size of a large coin to others large enough to hold two grown men.

Greenbrier River Trail

The Greenbrier River Trail is a 78-mile long former railroad converted to a multi-purpose recreational trail. The Greenbrier River is a tributary to the New River; it is the longest unblocked river in the eastern United States. The Greenbrier River hosts year-round fishing and leisurely recreational boating, canoeing, and kayaking.

Organ Cave

Organ Cave is one of approximately 50 caves found on the Organ Cave Plateau of the Greenbrier Limestone. It was mined extensively for saltpeter during the 19th Century, utilized for Confederate Army church services, contains a wealth of paleontological finds. It became a commercial cave in 1835, making it one of the oldest show caves in the United States; it is listed on the National Register of Historic Places and as a National Natural Landmark (ORGAN CAVE, 2017). It is a contact cave with the active drainage cut into the underlying Maccrady shale. It displays a dendritic drainage system with multiple streams merging to a common resurgence on Second Creek (COLE, 2018).

Thurmond Historic District

During the first two decades of the 1900s, Thurmond was a classic boomtown. With the huge amounts of coal brought in from area mines, it had the largest revenue on the Chesapeake & Ohio Railway. Having many coal barons among its patrons, Thurmond's banks were the richest in the state. The town's stores and saloons did a remarkable business, and its hotels and boarding houses were constantly overflowing. With the advent of diesel locomotives, and less coal coming in from local mines, the town began a steady decline. Today, the town remains surprisingly untouched by modern development (NATIONAL PARK SERVICE, 2017).

New River Gorge Bridge, Grandview Viewpoint and Visitor Center

The New River, one of the world's oldest rivers, flows through Fayette County and borders Raleigh County. Geologic interpretation of the rocks and geological phenomenon associated with the gorge indicate that the New River could be as young as three million years or as old as 320 million years (LESSING 1986, apud NATIONAL PARK SERVICE, 2009). According to Grafton & Grafton (1980, apud NATIONAL PARK SERVICE, 2009), despite questions regarding the age of the New River, it is one of the oldest rivers in the Appalachians.

The section of the New River from Bluestone Dam to Gauley Bridge is listed on the Nationwide Rivers Inventory of free-flowing rivers with Outstandingly Remarkable Values (ORVs) pursuant to Section 5(d) of the National Wild and Scenic Rivers Act (16

U.S.C 1271-1287). The New River possesses four ORVs, including (NATIONAL PARK SERVICE 1982, *apud* NATIONAL PARK SERVICE 2011, p. 64):

- wildlife (23 federally-designated threatened or endangered species, including New River crayfish, big mouth chub, Kanawha darter, New River snail, and ephemeral cave scud)
- culture (the New River Bridge – the largest expansion bridge in the world)
- recreation (a nationally recognized whitewater recreation area)
- geology (reported to be the oldest river – geologically – in North America)

Accordingly, all federal agencies must seek to avoid or mitigate actions that would adversely affect the river. It begins near the summit of the Blue Ridge in North Carolina flowing for approximately 483 km, where it meets the Gauley River to form the Kanawha River. The New River has incised down through over 490 m, sculpting the spectacular New River Gorge in its wake, with typical canyon geomorphology lacking significant alluvial deposits. The Bridge is a landmark included in the National Register of Historic Places (Fig 3).

Figure 3: New River Gorge Bridge, West Virginia.

Source: authors

The Grandview section of the park includes overlooks, a visitor center, five hiking trails, ranger-led walks and talks, playgrounds and picnic areas. It provides dramatic scenery, and on a clear day, you can see directly seven miles of the New River and the town of Quinnimont.

Established in 1978, New River Gorge National River encompasses over 70,000 acres of land along 53 miles of the New River, and continues to carve the deepest and longest river gorge in the Appalachian Mountains (NATIONAL PARK SERVICE, 2013). This is a National Park Unit, and an American Heritage River. Today, the New River has world-acclaimed white water rafting (from class I to V) and the famous Bridge Day Festival highlighting Base-jumping, rappelling, and bungee jumping. Rock climbing is popular, with many popular climbing routes throughout the area.

Davis Spring

The largest spring in West Virginia, it is located west of Ronceverte, on the Greenbrier River. The Davis Spring Basin is about 189 square kilometers in size, and is the largest karst basin in the state. According to Jones (2018), the spring rises at the base of a cliff and flows on the surface for about 300 meters to the river. About 80% of the Davis Spring drainage basin is underlaid by carbonates of the Greenbrier Group. Several large contact caves including Ludington and Wades caves drain to Davis Spring along with the subsurface runoff from the Lewisburg area.

Gauley River National Recreation Area

Also protected nationally, meets the New River in Fayette County, to form the Kanawha River, which is the economic hub of West Virginia. Gauley Season is a world-renowned white water adventure season every autumn, although recreational boaters run the Gauley River year-round.

Beckley Exhibition Coal Mine

This historic coalmine offers daily tours and a history lesson on coal mining in Appalachia. Mine operations ceased in 1953, and the Beckley Exhibition Coal Mine opened in 1962, as the first historic site wholly dedicated to educating the public about coal mining. It was listed on the National Register of Historic Places in 1988.

Tamarack

Tamarack is a cultural center highlighting West Virginia artists and craftsmen, artisan products, and food fare. Tamarack's striking, peaked red roof and attractively landscaped grounds draw half a million visitors annually. Metal, apparel, jewelry, souvenirs, wood, glass, sculpture, furniture, pottery, outdoor decor, fine craft, musical instrument, books, and homemade food items and candies can be found. The area has dance performances,

theater camp, movies, music and other events. Guests can participate in a variety of hands-on classes in pottery, culinary arts, woodworking and mixed media art (TAMARACK, 2018).

Summit Bechtel Reserve

Situated on reclaimed mine lands, the Summit is a training, Scouting, and adventure center for youth and adults involved in the Boy Scouts of America and anyone who loves the outdoors (SUMMIT BECHTEL, 2018). This leadership, adventure, and Scout camp provide lodging for nearly 50,000 youth adventurers. This excellent leisure infrastructure is one of the critical hubs within the AG, related with the educative component.

National Coal Heritage Area (NCHA) and Coal Heritage Park in Mount Hope

The NCHA encompasses hundreds of square miles covering 13 counties in southern West Virginia, where thousands of miners labored to produce the coal. The West Virginia "smokeless" coalfield is a remarkable legacy of working-class culture, industrial might, racial and ethnic diversity, and the creation of a unique and distinctive culture of national significance. The coalmines in this region produced the abundant economic fuel which transformed rural America into an industrial power, provided jobs and homes for thousands of people, made fortunes for those who invested in the industry, and produced a storied society with a peculiar and fascinating legacy (NATIONAL COAL HERITAGE AREA, 2018 B).

Cathedral Falls

One of West Virginia's highest and most scenic waterfalls. It is a steep cascade falls into a natural amphitheatre. This is a very easy waterfall to visit, visible from the road (GO WATERFALLING, 2009).

Whipple Company Store Museum

It is a store at the coal camp and coalmine of Whipple open from 1890 to 1954. One of the last standing wooden company stores today, everything from candy to caskets was sold at the company store (Fig. 4). Paying with scrip or buying on credit was a way of life for the miners and their families. Whipple Company Store is a non-profit museum whose goal is to preserve and protect the coal mining heritage (NATIONAL COAL HERITAGE AREA, 2018 A).

Figure 4: Some of the coal mining objects at the Whipple Company Store Museum, West Virginia.

Source: authors

Greenbrier Resort

This is a well-known large-scale lodge offering hot springs, first class lodging and restaurant opportunities (Fig. 5), and an underground labyrinth designed to shelter the US President and the US Congress in times of national crisis (now inactive).

Figure 5: The Greenbrier Resort, located at the Greenbrier County, West Virginia.

Source: authors

Lost World Caverns

Show cave within the Geopark that offers walking tours, where it can be seen "The Snowy Chandelier", a 30-ton compound stalactite, and the "Bridal Veil", a beautiful column of sparkling white calcite. Bob Addis, who was manager of the cave, set a Guinness World Record for ''stalagmite sitting'' in 1971 by staying on top of a stalagmite for almost 16 days. Geologically, Lost World Caverns is in the Greenbrier Group limestones of the middle Mississippian Age (JONES, 2010).

THE GEOCAMP INITIATIVE

Regarding the academic push, West Virginia University developed an educational camp focusing on the geological heritage of the site, called a GeoCamp. A GeoCamp is a 1-3 week long camp that focuses on science, technology, engineering, and mathematics (STEM). According to Bakony-Balaton Geopark (n.d.), Geocamps are excellent opportunities for school groups to spend a few days in nature and learn about the geological processes that have shaped the landscape. While participating in these programs, children enjoy the

impressive and spectacular landscape and they build up a relationship with the landscape, the «inactive» rocks and caves and other geosites. In addition, they realize how important it is to preserve them for the present and for future generations.

The United State Geological Survey (USGS) and the West Virginia Geological & Economic Survey teamed with West Virginia University to initiate the Appalachian Geoscience GeoCamp in 2018. Students explored concepts and skills related to the earth sciences, including orienteering, topographic and geologic mapping, and forest ecology, among others. The GeoCamp used a non-traditional approach by integrating field-based earth science and mapping lessons with outdoor adventures, like rock climbing, rafting, cycling and caving. The purpose was to engage high school students in Science, Technology, Engineering and Mathematics (STEM) through outdoor recreation and adventure-based activities. The GeoCamp will support the notion of the development of the Geopark in West Virginia by informing people about the role of geology in the state of West Virginia.

NEXT STEPS

It is important to note that the attractiveness of an area that claims the Global Geopark title must first include its geological heritage, among other aspects. Because most of the geosites presented here already have different levels of protection, a two-pronged effort is now underway to promote the Appalachian Geopark Project— tourism economics effort and an academic effort.

Tourism development in an area depends on the 'pull-push' factors. The pull factors refer to the attractiveness of a destination (e.g., arts, festivals, natural beauty, coal heritage, local people, etc.) while the push factors are intrinsic motivators (e.g., desire for rural authenticity, escape, adventure, second homes for retirees, etc.). The AG area is rich in natural and cultural assets, but peripheral to well-developed destinations where tourists are concentrated (e.g., New River Gorge National Park). Accordingly, strategies are needed to bridge the two areas so that tourists from one area with more visitors can be channeled to the area with less visitors.

Packaging/networking has been proven to be an effective approach that channels wealthy tourists, both domestic and international, from established tourism areas to undeveloped peripheral areas that visitors would be unlikely to visit otherwise. A good example is Bahia Principe Hotels & Resorts in Cancun, Mexico, a popular luxury destination for wealthy tourists who are transported to remote, lower income rural areas through various tourism packages. In the West Virginia situation, Greenbrier, Fayette, and Raleigh are more developed in terms of tourism infrastructures, facilities, and services than its neighboring counties. The New River Gorge, the Summit Bechtel Reserve, and other popular attractions are located within the Geopark Project, already attracting millions of visitors per year and creating significant economic impact. According to a survey conducted by the Longwoods International (2014), of a total of 15.2 million overnight trips took place in the New River/Greenbrier Valley area.

This relative wealth can be shared with neighboring counties through the development of the tourism packages. This project will likely result in the increase of visitor numbers and associated spending in the counties surrounding the AG, which will generate more jobs, more revenues, and more tax dollars for the study area and for the state. New businesses such as restaurants, lodging facilities, gift stores, and tour operators will be created to meet the increasing market demand. With more inbound visitors, the sales of existing businesses including gas stations, dining services, and grocery stores may also increase. In addition, a proportion of those who lost their jobs in the coal mining industry will be trained for work placement in tourism-related businesses.

CONCLUSIONS

West Virginia is positioned to implement the first Geopark in the United States. This opportunity can bring economic development in rural communities through national/international tourism. Also, utilizing existing infrastructure – no new restrictions, no new land use. The goals with this project are link tourism to sustainable community development, as measured by increased economic impact in the communities. Also, jump-start local small businesses (e.g., outfitter guide companies, angling guides, etc.).

Although the literature is lacking in the economic impacts of Geoparks, there is no doubt that there is a positive and lasting drive toward community sustainability through Geopark development. Proponents of the Appalachian Geopark Project, including West Virginia University administrators and faculty, are working with community members to seek funding through a variety of sources. As noted, Geoparks contribute to the long-term sustainability of the communities in which they are located. In due time the Appalachian Geopark will hopefully provide this sustainability across various communities in southern West Virginia.

REFERENCES

BAKONY–BALATON GEOPARK. **Bakony–Balaton Geopark:** an introduction. Available at: http://www.geopark.hu/en/home/bakony-balaton-geopark/introduction. Retrieved in: 18 Dec.2018.

BOWEN, Eric; BURTON, Mark; CHRISTIADI, David Clarke; DAVIS, Rebecca; DESKINS, John; JACKSON, Randall; JAROSI, Péter; LEGO, Brian; MURRAY, Matthew; SCHAEFFER, Peter; SIMS, Charles. **An economic analysis of the Appalachian coal industry ecosystem.** Washington DC), 14p. Available at: from https://www.arc.gov/research/researchreportdetails.asp?REPORT_ID=141. Retrieved in: 16 Mar.2018.

COLE, Raymond. Organ Cave. In: WHITE, William B. **Caves and Karst of the Greenbrier Valley in West Virginia**. Cham (Switzerland): Springer, 2018. p. 249-299.

GO WATERFALLING. Cathedral Falls, 2009. Available at: http://www.gowaterfalling.com/waterfalls/cathedral.shtml. Retrieved in: 12 Sept.2015.

DEAN RUNYAN ASSOCIATES. **West Virginia travel impacts 2000-2016.** Charleston, 2017, 51p. Available at: http://www.deanrunyan.com/doc_library/WVImp.pdf. Retrieved in: 16 Mar.2018.

DYKEMAN, Wilma. Appalachian Mountains. In: **Encyclopedia Britannica.** Available at: https://www.britannica.com/place/Appalachian-Mountains . Retrieved in: 3 Dec.2018.

ENGLE, Rob. W.VA. **Tourism campaign aims to attract out of staters, millennials**. 2016. Available at: http://wvpublic.org/post/wva-tourism-campaign-aims-attract-out-staters-millenials#stream/0 Retrieved in: 17 Mar.2018.

GARTNER, William C. Rural tourism development in the USA. **International Journal of Tourism Research**, v. 6, n. 3, p. 151-164, 2004.

HODGE, Dan. **Appalachian coal industry, power generation and supply chain.** 2016. 34p. Available at: https://www.arc.gov/assets/research_reports/CoalIndustryPowerGenerationandSupplyChainReport.pdf. Retrieved in: 15 mar. 2018.

HORTON, John D.; SAN JUAN, Carma A.; STOESER, Douglas B. **The State Geologic Map Compilation** (SGMC geodatabase of the conterminous United States). Denver: U.S. Geological Survey Data Series**,** 1052. 2017, 46 p. Available at: https://pubs.er.usgs.gov/publication/ds1052. Retrieved in: 14 dec. 2018.

JONES, William K. **Lost World Caverns**. e-WV: The West Virginia Encyclopedia. 2010. Available at: https://www.wvencyclopedia.org/articles/1458. Retrieved in: 13 aug.2018.

_____. Hydrology of the Greenbrier Karst. In: WHITE, William B. **Caves and Karst of the Greenbrier Valley in West Virginia**. Cham (Switzerland): Springer, 2018. p. 21-43.

LONGWOODS INTERNATIONAL. **Can tourism help revive West Virginia's coal-based economy?** 2016. Available at: http://longwoods-intl.com/can-tourism-help-revive-west-virginias-coal-based-economy/. Retrieved in: 17 mar.2018.

MANDALA RESEARCH. **The cultural and heritage traveler 2013 edition.** Available at: http://mandalaresearch.com/downloads/2013-cultural-heritage-traveler-report/ Retrieved in: 16 mar. 2018.

NATIONAL COAL HERITAGE AREA. **Whipple Company Store**. Available at: http://www.coalheritage.org/page.aspx?id=112 2018a. Retrieved in: 11 Dec.2018.

_____. **National Coal Heritage Area Economic Impact Report.** 2018b. Available at: http://www.coalheritage.org. Retrieved in: 19 dec. 2018.

NATIONAL PARK SERVICE. **General Management Plan New River Gorge National River: Environmental Impact Statement (Draft)**. Glen Jean (West Virginia): National Park Service. 2009.

_____. **New River Gorge:** a River runs trough it. Glen Jean, 2013. Available at: https://www.nps.gov/neri/a-river-runs-through-it.htm Retrieved in: 19 dec.2018.

_____. **New River Gorge:** Thurmond. Glen Jean, 2017. Available at: https://www.nps.gov/neri/learn/historyculture/thurmond.htm Retrieved in: 24 dec.2018.

ORGAN CAVE. **About us.** 2017. Available at: http://www.organcave.com Retrieved in: 14 dec. 2018.

PALMER, Arthur. Cave exploration as a guide to geologic research in the Appalachians. **Journal of Cave and Karst Studies**, v. 71, n. 3, p. 180–192, 2009.

PEPPERS, Russel A. **Pathological Correlation of Major Pennsylvanian (Middle and Upper Carboniferous) Chronostratigraphic Boundaries in Illinois and Other Coal Basins.** Boulder: Geological Society of America Memoir, 1996. (188).

REHBEIN, Ed. **Exploring the Wilds of West Virginia:** A Hiker's Guide to Beauty off the Beaten Path. Indianapolis: Dog Ear Publishing, 2016.

STOCKS, Lee; SHEARS, Andrew. Cave density of the Greenbrier limestone group, West Virginia. **Papers in Applied Geography,** v. 1, n. 3, p. 217-225, 2015.

STOKES, Andrea M.; COOK, Suzanne; DREW, Dawn. **Geotourism:** the new trend in travel. 2003. Available at: http://www.egret.us/clinton/Geotourism%20The%20New%20Trend%20in%20Travel.pdf. Retrieved in: 18 mar. 2018.

SUMMIT BECHTEL. **The summit story.** Available at: http://www.summitbsa.org/about-us/summit-story/. Retrieved in: 14 dec.2018.

UNESCO. **UNESCO Global Geoparks**. Available at: http://unesdoc.unesco.org/images/0024/002436/243650e.pdf Retrieved in: 17 mar. 2016.

URS. **Rural tourism package: Monitoring and evaluation framework**. Manchester, 2010. 70p. Available at: http://randd.defra.gov.uk/Document.aspx?Document=12045_RuralTourismFramework-FinalReport.pdf. Retrieved in: 17 mar. 2018.

US TRAVEL ASSOCIATION. **Travel trend index.** Washington, 2017. Available at: https://www.ustravel.org/research/travel-trends-index. Retrieved in: 16 mar. 2018.

US TRAVEL AND TOURISM ADVISORY BOARD. **Overview**. Washington, 2011. Available at: http://trade.gov/ttab/docs/TTAB_Thumb_NEWSMALL.pdf. Retrieved in: 16 mar. 2018.

TAMARACK. **About us**. 2018. Available at: https://www.tamarackwv.com/about-us. Retrieved in: 10 aug. 2018.

WEST VIRGINIA DIVISION OF NATURAL RESOURCES. **Babcock State Park Brochure**. Available at: http://www.wvcommerce.org/App_Media/Assets/publications/travelrec/BabcockBrochure.pdf. Retrieved in: 14 dec. 2018.

_____. **Hawks Nest State Park Brochure**. Available at: http://www.wvcommerce.org/App_Media/Assets/publications/travelrec/HawksNestBrochure.pdf Retrieved in: 11 jan. 2019.

WEST VIRGINIA GEOLOGICAL & ECONOMIC SURVEY. Physiographic Provinces of West Virginia. 2017. Available at http://www.wvgs.wvnet.edu/www/maps/pprovinces.htm Retrieved in: 14 dec. 2018.

WV WORK FORCE. County data release 3/6/2018. Available at: http://lmi.workforcewv.org/DataRelease/CountyRelease.html. Retrieved in: 14 dec.2018.

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