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Managing the rock-climbing economy: a case from Chattanooga

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ABSTRACT

Chattanooga is central to many rock-climbing locations that benefit the local economy. However, a lack of metrics quantifying the positive impacts render reliable access to and protection of land for the purpose of rock-climbing problematic. An influx of climbers also complicates land management policies and priorities. The purpose of this study was to determine the economic impacts of climbing in Chattanooga, and to clarify management preferences of activity participants.

Surveys were collected over nine months at five popular climbing areas. Information regarding demographics, climbing style and level, management preferences, and spending patterns were collected. Economic data were analyzed with IMPLAN software to determine indirect and induced impacts, as well as state and federal tax implications. An total impact of US\$7 million was assessed, with another half-million in state and federal taxes. Management preferences differed by climbing site and number of visits, demonstrating the diversity of opinion within the climbing community.

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Economic impact; rock climbing; adventure tourism; natural resource recreation

Introduction

The growth of nature-based sports is an exciting and challenging phenomenon for participants and providers. The economic, social, and cultural impacts may be difficult to trace, due to relaxed permitting, remoteness of activity sites, and dispersed clientele. This study reports the methods and findings from an impact study on an emerging outdoor destination. Chattanooga is central to a variety of rock-climbing locations that have benefitted the local economy for decades. Having been described as ‘America’s dirtiest city’ in 1969 (Neimark 2016), Chattanooga has successfully rebranded itself as an outdoor destination, recently winning a popular competition for the Best Outdoor Town Ever from Outside Magazine. This recognition has not come easily, and it brings with it many complications. Historically, climbers in this region have been tolerated but not courted (cf. Frank 2012). A lack of metrics quantifying the positive impacts have rendered it difficult to justify access to and protection of land for the purpose of rock-climbing. An influx of climbers also complicates land management policies and priorities. The purpose of this study was to determine the economic impacts of rock-climbers to the Chattanooga region, and to clarify management proposals and priorities of activity participants.

Literature review

Commodifying natural landscapes

Visionaries, Frederick Law Olmstead and John Muir, were among the first to reference the potential for natural landscapes, not just as a space to foster recreation, but as a means to ensure economic viability as well. In an 1865 report commissioned by the state of California, Olmstead asserted that natural scenes of impressive character represented a financial opportunity for governments based upon their ability to draw tourists seeking to escape the mundane in search of life experiences which were novel and unique.

It is but sixteen years since the Yosemite was first seen by a white man. Several visitors have since made a journey of several thousand miles at large cost to see it, and notwithstanding the difficulties which now interpose, hundreds resort to it annually. Before many years, if proper facilities are offered, these hundreds will become thousands and in a century the whole number of visitors will be counted by millions (Carr 2014, 11).

However, if economic stimulus were to be realized, it would require that local governments provide access, conserve the landscape, and promote it so that physical spaces not become monopolized by the few and experienced only by the elite (Olmstead 1865).

Olmstead's recommendations for outdoor spaces were novel at the time, but have since had significant implications on the commodification of natural resources. Natural resources, according to Howe (1979), include settings and systems that are useful to humans *or could be* under plausible technological, economic, and social circumstances. When a place can be characterized according to desirable features, it establishes itself as a commodified space, as it possesses a competitive advantage over alternative locations (Cross 2001). This relationship is thought to be more cognitive and physical rather than emotional. In other words, the natural environment is the vital resource that enhances the experience of a desired activity (Williams and Roggenbuck 1989). Similarly, the meaning an individual associates with place becomes a product of the collective attributes and amenities that render the experience important to one's self (Williams et al. 1992). This commodified relationship of space triggered a change in how local communities, states, and regions utilized historical architecture or natural landscape aesthetics for economic stimulus through nature-based adventure sport tourism (defined as travelling for the purpose of participating in an activity that features a high level of danger).

There are innumerable ways in which outdoor settings, sport, and recreation enrich a community's status (Crompton 2007; Harnik and Crompton 2014), but the most widely acknowledged comes in the form of economic impact. A community or region will view forms of subsidized programming and facilities (e.g. climbing sites on state sponsored land) as inducing economic impact permitting that the spending originates from visitors travelling from outside their area, and come as a direct result of the leisure commodity (i.e. rock climbing, whitewater rafting, alpine skiing). Fundamental elements to this concept include: (1) the recreation commodity must be exported from the relevant area to bring in new money, which can then recycle through the area's economy, producing employment, income, etc.; and (2) the relevant area must be clearly delineated (Beardsley 1971). For instance, visitors travelling to Chattanooga from a neighboring state for a rock-climbing excursion may provide net gains to the Chattanooga area in the form of

lodging, food, gas, and miscellaneous expenditures made throughout their stay. This money then has a residual effect on the local economy as initial spending recirculates as business recipients purchase supplies and pay employees. This rippling action is referred to as a multiplier effect (Crompton 2011).

Despite recent evidence of the efficacy for state and national parks to create economic stimulus through outdoor adventure sport tourism (c.f. Cullinane and Koontz 2017; Maples et al. 2017; Taylor et al. 2013), outdoor space continues to be a difficult sell to politicians. According to Jeong and Crompton (2015), outdoor spaces, particularly those which are not artificially constructed, have difficulty securing budgetary support for multiple reasons, with the more pertinent explanations relating to: (1) outdoor spaces rarely present a prominent issue in political campaigns, (2) they are heavily subsidized through local, state and/or federal taxes, and (3) costs are easily visible while their economic value is not. Further, unlike special events whereby net gains in economic activity can easily be observed, natural landscapes pose greater challenges. For instance, permits to rock climb cease to exist in many locations, rarely is parking monitored with fees or tracking procedures, and there is no database with contact information that can be used to survey rock climbers. As a consequence, parks and natural landscapes are perceived as being 'invisible assets,' commodities often times overlooked by legislators. When this occurs, Olmstead's recommendations fail to be realized because marketing dollars are not being allocated to promote visitation, landscape architectural work is not conducted to accelerate access, and conservation funds are not awarded to safeguard a destination's differentiating amenities. Thus, when the debate over opportunity costs occurs among public policy decision makers, outdoor spaces generally lose out in the context of utility unless credible and significant economic impact support is provided.

Application of destination tourism model

Tourism activities predominantly occur at destinations that offer a combination of tourism products for visitors, providing them an integrated and unique experience (Buhalis 2000). For instance, Kotler, Haider, and Rein (1993) summarize a destination as a place that incorporates a complementary set of attractions, events, services, and goods to enhance a value proposition to visitors. In this way, a sport tourism destination's product mix and subsequent benefits that a tourism location can offer are what distinguishes it from substitute choices. This may occur through a destination's unique qualities and/or benefits to visitors, or through the enhanced 'cache' that an event affords to a destination (Jago et al. 2003). In reference to the former, Pike (2002) insists that destination events have a significant advantage over manufactured tourism environments because of their inimitable natural resources (e.g. landscapes and terrain). Given the dynamic and competitive nature of destination tourism, the success of a destination, then, is often predicated on its ability to provide and maintain such resources in a way that enriches tourists' individual needs and desires (Teodorescu et al. 2012).

Nature-based adventure sport tourism provides an excellent example of natural resource commodification. For instance, mountain destinations may become an attractive choice among alpine ski enthusiasts seeking a particular ski resort which possesses distinctive topography and a history of smooth, dry, and abundant snow fall. Likewise, an avid kayaker may select a destination based on its close proximity to technical, big water

rapids that offer unique challenges to paddlers. These examples reflect an opportunity for destination event marketers to promote environmental and geographical resources as successful sport attractions that offer 1) benefits, 2) perceived by a sizeable customer group, 3) which these customers value and are willing to pay for, and 4) cannot readily be obtained elsewhere (Day and Wensley 1988).

Chattanooga has experienced steady growth since its rebranding in the early 1980s with population growth outpacing the national average for the last 20 years (O'Neil 2012). Tourism growth demonstrated similar gains, often double the annual growth rates of other regional destinations such as Atlanta, GA and Asheville, NC (O'Neil 2012) and reaching the milestone of US\$1 billion in economic impact in 2015 (Flessner 2016). Much of this has been driven by accolades from popular media sources, regarding the aesthetics and outdoor recreational opportunities in the region (cf. Davis 2016). In addition, high-profile special events have helped to highlight Chattanooga's natural and built environment. In 2017, for example, the city hosted three separate Ironman™ competitions, each drawing 2500 competitors and their families (Tanner 2017).

In regard to Butler's (1980) tourism life cycle model, Chattanooga has entered the 'development' stage, being an established tourism destination with a well-defined tourism market. Maturation of the local tourism industry is evidenced by the emergence of small businesses catering to visitors, including paddleboard rentals, bike tour vendors, and even boutique hotels, such as the climbing-centric 'Crash Pad' hostel. This growth has not come without complications. The city has experienced the issues of lagging infrastructure, localized inflation, and gentrification that are common to tourism destinations (Cook 2015b). In addition, many of the attractions and special events are natural-resource dependent. Hiking, climbing, whitewater kayaking, and adventure races all incur wear on green spaces and increase traffic to natural areas adjacent to the city. This has raised concerns from local residents and land managers, provoking fears of 'loving our natural treasures to death' (Cook 2017). Before entering Butler's (1980) stages of 'consolidation' and 'stagnation,' where visitor capacity is reached, resources are compromised and travel interests wane, an inclusive tourism/land management model should be explored.

Natural resource management

Land management policies vary by agency, region, and geographic disposition. State and national forests embrace a multiple-use mindset, where recreation coexists with conservation, timbering, and resource extraction (Newsome, Moore, and Dowling 2012). State and national parks adhere to preservationist principles, restricting activities that would grossly impact the natural environment. Private landowner principles range across the spectrum. Regional differences exist within the preservation-conservation continuum, often due to practical necessity. Many parks in the western United States, for example, require special-use permits that limit visitor traffic to popular destinations. The southeastern U.S., including Chattanooga, is less restrictive, possibly due to a combination of lower visitation and a cultural tendency to resist bureaucratic (i.e. governmental) oversight (Somin 2014). The local Access Fund director, for instance, was taken aback at the lack of concern expressed by locals when confronted with the fact that they were climbing in areas with no legal access (Z. Lesch-Huie, personal communication, 12 April 2015). This attitude can

place climbers at odds with state and federal land agencies, who often prefer a top-down approach to land policy based on a one-size-fits-all perspective (Culhane 2013).

Many agencies have begun to experiment with a more participative approach to land management (Bello, Carr, and Lovelock 2016; Jansson and Lindgren 2012; Plummer and Fennell 2009). This method may be preferred in areas where heavy-handed policy enforcement meets resistance from user groups. Collaborating with users and non-profits when drafting and enforcing policies imparts a sense of ownership to those who frequent protected areas. Feedback from users informs managing agencies about appropriate messaging and pragmatic solutions, while a sense of ownership enhances awareness of ecological impacts and self-enforcement of policies (Kil, Holland, and Stein 2014; Smith, Siderelis, and Moore 2010). The process of developing best practices for recreational activities across boundaries can help create a clear, unified policy that benefits both users and managers.

Managing local climbing

The current lack of a cohesive land management policy across agencies complicates the execution of policy planning, and often confuses users who recreate across agency lines. Climbing regulations differ at each location in our study, though access is managed by the Southeastern Climbers Coalition (SCC) and a local chapter of the Access Fund, two non-profit advocacy groups responsible for maintaining climbing areas so that they remain open. Regulations and natural features also dictate the style of climbing at various locations. The most restrictive area (Sunset Park) is located within the Chattanooga Military Park, managed by the National Park Service. Access to this site is strictly monitored, and only *traditional* style climbing is permitted (i.e. no permanent bolts are affixed to the rock). Two areas are managed by the State, albeit through different agencies. Foster Falls, a popular *sport-climbing* area, lies within the Tennessee State Park system, while the Tennessee Wall, a well-known *traditional* and *sport-climbing* crag, exists in the bounds of a Tennessee State Forest. Unlike *traditional* climbing areas, *sport-climbing* locations have permanent bolts affixed to the rock, requiring less gear and expertise, and often attracting a different clientele. Rocktown, a *bouldering* area (i.e. climbing lower to the ground with no rope) south of Chattanooga, is managed by the Georgia Department of Natural Resources. Finally, the most-visited site in our study was the Stone Fort (aka Little Rock City) bouldering area, which is located on a private golf course north of the city.

The variety of climbing styles and management models demonstrates the complexity in generating a unified climbing policy in the region. Historically, climbing has been seen as a liability and access remains precarious (c.f. Frank 2012). Climbing-specific access trails, bridges, signage and bolted routes are typically established and maintained by the SCC and an army of volunteers. Funding for such projects comes from personal donations, grants, and, occasionally, matching funds from land management agencies. There is no recurring funding from city, county, or state agencies. Legal resources (i.e. liability consulting, private property rights, etc.) are managed in conjunction with the Access Fund. Both the SCC and the local chapter of the Access Fund are directed by a single paid employee, despite the tall order of managing climbing areas from Florida to Kentucky.

Given the unknown economic impact of climbing in a region renowned for its resources, the purpose of this study was to determine the scope of climbing tourism

and its impact on the local economy (i.e. Hamilton County). A secondary purpose was to explore user preferences for management policies, in order to lay the foundation for a cohesive, inclusive, sustainable climbing plan that supports residents and tourists. The following section will detail the methods, measures, and analyses incorporated in this study.

Methods

Data collection

Procedures outlined in the subsequent sections were designed to estimate the economic impact of rock climbing to Hamilton County, Tennessee. To calculate net new spending to the local area, five climbing areas were surveyed which allowed visitor expenditure data to act as a foundation for formulating an overall estimate of climbers' stimulus to Chattanooga. A visitor was defined as any climber who had travelled 30 miles or more with the primary intention to rock climb in Hamilton County. Creating a 'non-local' delineation based upon miles travelled has been considered a more effective approach than county or zip code identifiers due to respondents' lack of awareness of state county boundaries (Jeong and Crompton 2015). A local vs. non-local delineation was assured with an initial question posed to prospective respondents upon greeting them and at the beginning of the survey. Following this initial screening, climbers completed a self-administered survey comprised of questions garnering information pertaining to demographics, climbing style and level, management preferences, travel habits, and spending patterns. Spending categories provided in the questionnaire included food, lodging, entertainment, shopping (including outdoor recreation-related expenditures such as gear, apparel, etc.), transportation (i.e. gas), and other miscellaneous retail items (un-related to outdoor recreational spending). Only those lodging in hotels, motels, hostels, and house rentals were calculated in the lodging estimate of the economic impact. Thus, no lodging impact was calculated for those who camped out during their stay.

Data were collected using procedures developed and refined by the Texas Park and Wildlife Department (TPWD). TPWD's model is considered to be an accurate regional, state, and national level approach to analyzing economic effects of natural environments (Kaczynski, Crompton, and Emerson 2003). This procedure relies on calculating personal spending, group size, as well as visiting days of those climbing within the geographical impact area. To give an example, an individual climber was first asked to report their personal spending with respect to the identified categories listed above. Then parties were asked to provide the total amount of individuals in their travelling party and to report how many days and nights they were intending to stay in Chattanooga. Thus, if a party of four climbers elected to spend three days in Chattanooga to climb, then the total amount of visiting days was 12. These data were used to inform average travel party size and number of visiting days for the study's sample.

Questionnaires were distributed on randomly selected weekdays and weekends over a period of nine months (September 2015–May 2016) at five climbing areas within a 30-minute drive radius of downtown Chattanooga. The nine-month period was established to ensure data was representative of times of year which could be characterized as peak and valley climbing seasons in the Southeast. Climbing sites were selected based upon advice given from a panel of individuals representing the SCC and the Access

Fund who were asked to identify areas which were most popular, accessible, and provided a variety of climbing options (i.e. degrees of difficulty, climbing type [sport, traditional, bouldering]). Further, previous experience in studying choice of climbing locations suggested that visitors to Chattanooga will climb at multiple sites surrounding the city rather than remaining at one site throughout their stay. This close proximity of sites is a benefit that Chattanooga provides climbers, with innumerable locales within a short drive time from the city. This also increased the likelihood of capturing climbers in the event one of the selected climbing destinations under study was not initially chosen by visitors.

Participants in the study were intercepted in parking lots located at trail heads used to enter and exit climbing locations. Additional surveys were collected at the base of climbing crags and at adjacent camp sites frequented by climbers staying overnight. Vocal checks were used to ensure duplicate surveys were not completed. Bias relating to estimation and population uncertainty was minimized by asking all climbers encountered by the research staff to complete the survey. Because probability sampling was not employed, visitors' homogeneity was further examined by conducting a statistical test (ANOVAs) that examined differences in spending behaviours across climbing sites. This examination rendered significant differences, $F(4,273)=7.01$, $p=.000$ only in the lodging category of spending. Post hoc analyses using a Bonferroni adjustment indicated that Foster Falls and Rocktown location climbers reported spending significantly less than other locations. This is explainable as each resides greater distances outside of Chattanooga than other popular sites and historically attract day trip climbers from neighboring cities, Nashville and Atlanta. As a result, visitors to these sites tend to stay less frequently in Chattanooga than those climbing in nearby locations. Previous research (c.f. Jeong and Crompton 2015) indicates that day and overnight visitors will demonstrate disparate spending habits and should be examined separately. Thus, in the effort to provide a conservative estimate, the researchers include a 'potential impact' figure for locations likely to include day-trippers. This 'potential impact' estimate was based on parking lot data collected at these sites (e.g. car counts & license plates). A supplemental study would need to be conducted to estimate true impacts generated from regional sites and provided to regional counties.

Ultimately, a total of 530 surveys were completed (97% response rate), including 366 visitors and 164 local residents. Local residents were subsequently removed from the analysis, as economic impact estimates are only concerned with net new money entering into a community from outside the geographical impact area (in this case a 30 mile radius). Local spending is deemed displaced spending for it would have been spent in the community regardless of recreational choice, and is thus, not part of economic stimulus (Crompton 2006).

Climber demographics were in line with national data (OIA 2016). A slight majority (52%) were male with an average age of 28 years. The average group size was 3.7, with visitors typically staying two days and 1.5 nights. Climbers made an average of 4.7 visits to Chattanooga in the previous 12 months. Nearly half (48%) camped out while visiting, with another 24% renting rooms at a hotel or hostel. Visitors and residents had a combined average of 5.7 years climbing experience, climbing traditional routes to 5.9+ (i.e. intermediate level), sport routes to 5.11 (i.e. intermediate to advanced), and bouldering at an average level of V5 (i.e.

intermediate to advanced). While some climbers to the area are undoubtedly beginners, the average skill level could be considered intermediate or higher.

Estimating overall spending

The reliability of expenditure estimates is largely dependent upon two factors: (1) the accuracy of the visitor count, and (2) methods of converting a sample’s expenditures to a greater visitor population. Estimating visitation occurring in open spaces presents logistical challenges due to an inability to comprehensively track visitors vis-à-vis turnstile entry or attendance figures. Further, climbers’ entrance into parks adjacent to Chattanooga is not tracked through visitation data. Such delimitations placed increased obligations on the researching team to establish measures by which to obtain visitation data and extrapolate the figures so that they may be representative of an overall spending estimation. To establish a pragmatic means of formulating estimations, researchers developed multipliers based on known visitor logs and sampled observations, similar to that utilized by the U.S. National Park Service (USNPS n.d.). Stone Fort climbing area was used as a constant by which other site visitation data could be formulated. Located on a private golf course, this location, unlike others, requires registration and a US\$9 entry fee, allowing for an exact number of visitors to be provided by the site managers. From this data, a ratio of visitors was then created from counts at other climbing locations by comparing climbing frequencies to Stone Fort. This ratio was based on all site visits while distributing surveys (weekdays and weekends), to ensure reliability. Using this method, a formula depicting approximate annual counts of climbers at all regional sites could be established. For example, every 1 person at Stone Fort represented .47 at Tennessee Wall (TW) and .06 at Sunset Rock (SR). Using this ratio, the total number of people per year at each location and the percentage of overall climbers found to be non-residents (70%) was identified. The formula below illustrates how total visitors were estimated and final demographic comparisons with other research can be seen in [Table 1](#).

$$SF + (.47)SF + (.06)SF + (.44)SF = 16,565.5(.70) = \text{Total Visiting Climbers}$$

Upon reaching an estimated calculation for total visiting climbers, further adjustments were needed to account for climbers who had reported making multiple trips to Hamilton

Table 1. Demographic comparison across studies.

Study	Maples and Bradley (2017)	Sims and Hodges (2004)	Chattanooga (current study)	Outdoor Participation Data (OIA 2016)
Gender	80% Male 20% Female	70% Male 30% Female	52% Male 48% Female	54% Male 46% Female
Age	18–35: 56%	< 20: 15%	< 20: 18%	6–17: 22%
	36–50: 32%	20–30: 65%	20–30: 67%	18–24: 11%
	51–64: 11%	31–40: 8%	31–40: 9%	25–44: 33%
	> 65: 1%	41–50: 7%	41–50: 4%	> 45: 34%
Household Income	< \$50k: 48%	< \$50k: 86%	Not Available	< \$50k: 35%
	\$50k–100k: 33%	\$50k–100k: 14%		\$50k–100k: 34%
	> 100k: 18%	> 100k: 0%		> 100k: 31%
Education	< BA/BS: 15%	< BA/BS: 44%	< BA/BS: 58%	< BA/BS: 59%
	BA/BS: 48%	BA/BS: 36%	BA/BS: 29%	BA/BS: 26%
	> BA/BS: 37%	> BA/BS: 20%	> BA/BS: 14%	> BA/BS: 14%

County throughout the year. To avoid inflating visitor estimates, unique visits to each location were determined by dividing total number of visits by average number of visits per year for each location (SF= 4.1, TW= 1.42, SR= 1.13). From this, unique climbing visits totalling 10,185 were found, with 7,130 of these visits being from persons who did not reside within the geographical impact area. Climbers also reported that for every climbing group ($M = 3.6$ people), there were, on average, 0.22 non-climbers accompanying them on their visit to Chattanooga. Given that non-climbers were not intercepted at the trailhead, they were added to the overall visitor numbers by multiplying the number of unique visitors by the average total expenditure, to arrive at the total direct expenditures for visitors on one visit.

$$\begin{aligned} \text{Total Direct Expenditures} = & [\text{Total Non-local visiting climbers} \\ & + ((\text{Total Non-local Visiting Climbers} \times \% \text{ of Non-Climbers in Group/Group Size})) \\ & \times \text{Average Expenditure per person} \end{aligned}$$

The Total Direct Expenditure value was then examined in relation to climbers' average trip per year. Average trip per year was determined by dividing annual climbing days in the region by average trip length. This formula is outlined below.

$$\text{Total Expenditures} = [\text{Average Trip Per Year}(9.5/2.0) \times \text{Total Direct Expenditures}]$$

Analyzing climbers' economic impact

Total direct expenditures in each economic category were entered as inputs using IMPLAN software. IMPLAN software utilizes unique characteristics associated with individual counties (i.e. economic structures and multiplier valuations) to ascertain how initial tourism spending influences complementary economies. For instance, total Economic Impact is the result of a non-linear ripple effect generated from the direct spending of visitors in Hamilton County. In [Table 2](#), the Direct Effect represents the marginal (non-leaked) money remaining in the region. Indirect Effects are the result of local businesses spending more on employment and materials, as a result of added business. Induced Effects include additional spending by local employees as a result of increased hours/income due to the activity. Further, these effects impact the region in various ways: 1) Employment: the number of full-year, full-time jobs supported by climbers, 2) Labour Income: added income for current employees, 3) Total Value: true profits after accounting for employment, taxes, and other everyday business expenses, and 4) Output: total overall sales and revenue from climbers. In the context of local interest, labour income is often deemed the most salient (and conservative) of induced effects for it reveals the economic benefits received by residents in relationship to costs invested (Crompton 2011). In contrast, sales-related outputs may have minimal interest for local governments due to it not directly affecting residents' standard of living.

Table 2. Illustration of direct, indirect, and induced impact for Hamilton county.

Impact Type	Employment	Labor Income (US\$)	Total Value Added (US\$)	Output (US\$)
Direct Effect	65.6	1,648,918.8	2,666,340.9	4,624,607.1
Indirect Effect	8.5	436,858.4	726,019.7	1,202,435.0
Induced Effect	9.2	422,532.4	712,579.3	1,137,013.4
Total Effect	83.3	2,508,309.7	4,104,940.0	6,964,055.6

Management policies and preferences

Responses for land management preferences were analyzed mainly for descriptive purposes, to provide guidance to the SCC, local, state, and federal policymakers. Where appropriate, correlations, X^2 , and analyses of variance (ANOVA) were conducted to determine significant relationships that may impact policy. For example, climbers who visit sites more often may express more ownership of an area, which could be utilized to aid in the drafting and enforcing of regulations in that area. Additionally, visitors and residents may differ on management preferences, creating a conflict of stakeholders. These items were developed with reference to similar surveys conducted at other climbing sites, and with the assistance of the SCC and Access Fund staff. The survey included questions about demographics, frequency of visits to major climbing sites in the last year, climbing destination preferences (five-point Likert scale; 10 items), responsibility for maintenance of site (personal, non-profit, land manager; five-point Likert scale, 3 items), and preferences for sustainably managing regional climbing sites (three-point scale; 7 items). Findings for all analyses are reported below, beginning with general descriptive statistics, followed by economic impact and finishing with management preferences.

Results

Economic impact

Chattanooga's surrounding landscape attracted over 16,565 non-resident visits during the 2015–16 climbing season, including 8,698 unique visitors. Sampling data estimates an annual direct impact of US\$6.4 million in local spending by participants, with indirect and induced impacts adding another half-million in revenue (see [Table 2](#)). When climbing areas, Foster Falls and Rocktown, were included in the analysis, a conservative impact of US\$10.3 million was deduced.

[Table 3](#) provides an illustration of non-local climbers' average spending in each respective category. Among the downtown industries most affected by climbing tourism, restaurants and bars, hotels, and retail stores demonstrated the greatest total value added with impacts of US\$1.1 million, US\$900 thousand, and US\$550 thousand, respectively. Due to the financial support to particular industries, climbing tourism is believed to support roughly 83 full time equivalent jobs in Chattanooga.

In addition to local stimulus, climbing tourism provided a significant impact at the state and national levels. Specifically, climbing in Chattanooga generates US\$484,417 in state taxes annually and over US\$500 thousand in federal taxes. For comparison with other economic impact research, industry statistics for Hamilton County, TN are presented in the [Tables 4](#) and [5](#).

Management preferences

According to collective responses from residents and tourists, factors most impactful in determining their choice of climbing destination were aesthetics (i.e. classic lines and nice views), variety of difficulty levels, novelty (i.e. new climbs, new experiences), and ease of registration/permits. Access that is free of charge, and proximity to urban

Table 3. Average expenditures per discrete category.

IMPLAN Sector	Spending Categories	Average Spending (US\$)	Total Spending (US\$)
413	Food services & Drinking places	55.35	1,989,092.26
411	Hotels and Motels	42.56	1,529,296.68
410	Entertainment	18.64	669,740.41
328	Shopping (Outdoor Rec.- Related)	18.08	649,669.09
326	Transportation (Gas)	37.31	1,340,748.61
329	General Retail (Un-related to Outdoor Rec.)	6.73	241,843.50
	Total Direct Impact	178.67	6,420,494.41

Table 4. Hamilton county economic profile.

Model Information			
Model Year	2015	Value Added	
GRP	US\$23,366,560,386	Employee Compensation	US\$10,724,342,523
Total Personal Income	US\$14,291,440,000	Proprietor Income	US\$1,687,727,630
Total Employment	234,314	Other Property Type Income	US\$9,685,591,575
		Tax on Production and Import	US\$1,268,898,658
Number of Industries	277	Total Value Added	US\$23,366,560,386
Land Area (Sq. Miles)	543		
Area Count	1	Final Demand	
Population	345,545	Households	12,139,279,201
Total Households	150,575	State/Local Government	US\$1,938,646,299
Average Household Income	US\$94,913	Federal Government	US\$1,058,661,983
		Capital	US\$5,084,902,517
Trade Flows Method	Trade Flows Model	Exports	US\$21,226,922,421
Model Status	Multipliers	Imports	–US\$17,358,855,836
		Institutional Sales	–US\$722,995,954
Economic Indicators		Total Final Demand:	US\$23,366,560,631
Shannon-Weaver Index	.71779		

Table 5. Top ten industries in Hamilton county.

Sector	Description	Employment	Labour Income (US\$)	Output (US\$)
413	Food services and drinking places	16,786	361,744,900	940,635,100
438	* Employment and payroll only (Educ only)	12,793	708,396,300	809,956,500
357	Insurance carriers	12,091	882,858,000	3,331,088,000
335	Transport by truck	10,093	488,825,500	1,367,557,000
394	Physicians, dentists, and other health	8,941	812,143,600	1,192,119,000
319	Wholesale trade businesses	7,672	576,134,900	1,564,165,000
382	Employment services	6,742	207,621,600	269,864,500
388	Services to buildings and dwellings	5,660	168,263,600	339,871,200
437	* Employment and payroll only (non-Educ)	5,035	321,957,800	366,903,500
397	Private hospitals	5,032	297,623,000	620,695,900

amenities were ranked lowest in the list of destination attractions (Figure 1). A one-way ANOVA between residents and visitors revealed no significant differences in destination preferences.

Some climbers make a single visit to Chattanooga with no intention to return. Additionally, climbers will visit some areas more often than others, typically driven by their preferred style of climbing. To determine site preferences of the most frequent visitors to each site, a correlation analysis was performed between site preferences and self-reported visits to each destination in the past 12 months (Table 6). This provides insight into management preferences of site stakeholders who may feel more ownership of particular

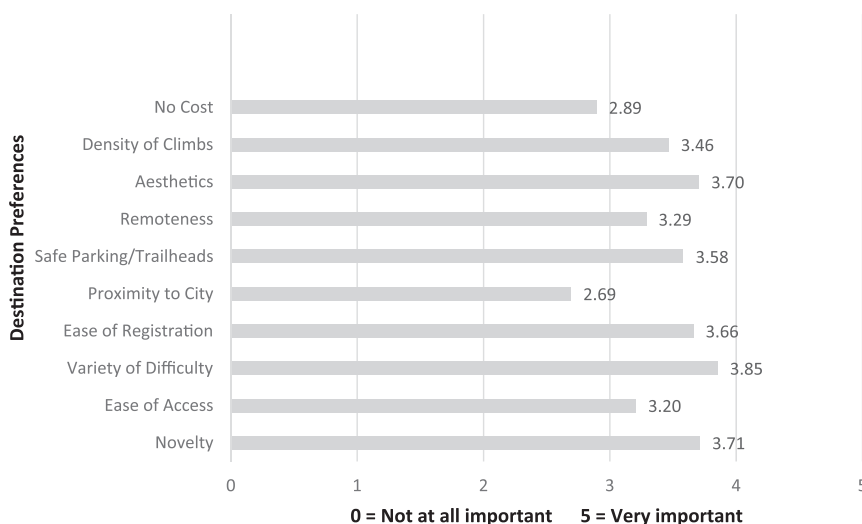


Figure 1. Destination preferences for all climbers.

crag. All significant relationships were negative, indicating that climbers who participate more frequently tend to care less about all factors. Put another way, newer climbers care more about these factors than seasoned climbers. Also of note is the lack of significance for any variables at both bouldering areas (Stone Fort and Rocktown).

Climbers in Chattanooga possess a sense of ownership for the crags in the area. Pairwise t-test comparisons support the belief that climbing area maintenance is more the responsibility of climbers ($M = 4.67$), than of the land manager ($M = 2.37$, $t = 36.755$, $p < .001$) or climbers' coalition ($M = 2.52$, $t = 35.591$, $p < .001$). A one-way ANOVA found no significant differences between residents and visitors on measures of responsibility. Commitment to the climbing sites is also evident in their actions, as the average climber donated 8.2 h of volunteering over the last year, for a total of 83,517 h, or the equivalent of US\$605,502 of work at the rate of minimum wage in Tennessee.

Descriptive statistics for sustainability initiatives are presented in Figure 2. A χ^2 analysis was conducted to aid with interpretation, revealed significant differences in opinion for all categories ($p < .01$), except for parking fees. Users strongly favoured donation boxes in the parking lot and reliance on non-profits to manage the site. They strongly opposed closing or selling off areas to private companies. The items 'reduce site maintenance' and 'increase restaurant taxes' may have been too vague to garner a clear response. Visitors demonstrated stronger support for donation boxes ($F = 7.423$, $p = .007$) and parking fees ($F = 13.677$, $p < .001$) than residents.

Discussion and implications

For several years, supporters of Chattanooga-based rock climbing have urged public policy decision-makers to create an outdoor recreation-specific budget that would ensure consistent funding for the promotion and conservation of outdoor space. Despite their pleading, no such line item exists in city, county, state or federal budgets, leaving broad initiatives (i.e. accessibility, marketing, maintenance, and land acquisition) insufficiently funded. It should

Table 6. Correlation analysis illustrating relationships between visits to each site (previous 12 months) and destination preferences.

	Well Cared For	Novelty	Access	Variety	Registration	Proximity	Safe	Wilderness	Aesthetics	Density	Cost
Foster Falls	−0.06	−0.11	−0.14**	−0.07	−0.16**	−0.14*	−0.05	0.01	−0.01	−0.11	−0.11
T Wall	−0.04	−0.21**	−0.23**	−0.17**	−0.18**	−0.20**	−0.09	−0.05	−0.07	−0.13*	−0.03
Sunset Rock	−0.05	−0.21**	−0.23**	−0.13*	−0.11	−0.20**	−0.17**	0.04	−0.06	−0.13*	−0.06
Stone Fort	−0.08	−0.02	−0.06	0.03	−0.04	0.03	−0.03	0.04	0.01	−0.07	−0.05
Rocktown	0.07	0.06	−0.04	0.03	−0.04	0.03	−0.07	−0.02	0.05	0.05	0.06

* = Significant at $p < .05$, ** = Significant at $p < .01$.

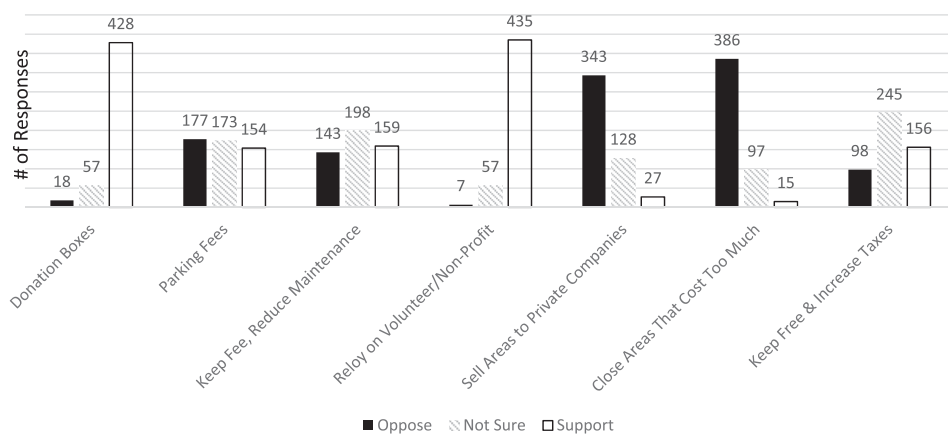


Figure 2. Preferences for sustainable management revenues.

be noted that park and recreational budgetary challenges are not isolated to Chattanooga, but rather appear to be quite ubiquitous. Crompton (2011) points out that such fiscal conservatism is largely attributable to parks' dependency on mere financial reporting to support their causes. As a consequence, recreational agencies are often mistaken for entities who merely take from the financial pot, while adding little in return. This is untrue, but without empirically revealing real value added, parks and recreation departments will continue to be overlooked. Thus, this study was conceptualized with the following goals which are all linked to the first one: (1) demonstrate economic stimulus, (2) derived from climbing pursuits, (3) in an attempt to provide leverage to those advocating for recreational land management and legislation. By demonstrating actual value added, outdoor adventure sports organizations can pursue financial support from government and/or grant-sponsoring agencies for preservation, access, and marketing, and other initiatives.

Cross promotional partnerships

The direct, indirect, and induced expenditure estimates illustrated from this research provide proof that climbing sites around Chattanooga create sizeable revenue to local, state, and federal budgets. This study's results, combined with recent work by Maples and Bradley (2017), who illustrated comparable impact figures for the Asheville, NC area, provide further evidence that economic impact can be used by parks and recreation to better position themselves at negotiating tables comprised of public, as well as private stakeholders. Each have much to gain from the US\$7 million in estimated stimulus attributable to climbing tourism, and all should become vested in the promotion and sustainment of its popularity. As noted from the research findings, restaurants, bars, hotels, and retail shops are currently profiting from rock climbing, but only a few are currently engaged in regular promotions to this population. One restaurateur currently promotes the Southeastern Climbing Coalition through '10% nights,' whereby 10% of the night's profits are donated to climbing initiatives supported by the SCC. However, collaborative promotional strategies, such as this one, are rare in Chattanooga.

Given the growing outdoor culture in the region, it would seem feasible to expand this to a host of other local businesses. By doing so, a fund could be established to support a variety of initiatives. For instance, a one-day promotional event for climbing sustainment during Chattanooga's annual outdoor festival, RiverRocks, might be embraced by local restaurants and shops in the area, which in turn, may drive festival participants and local outdoor advocates to those locations. Support from the city and county, as well as the visitor's bureau, would increase visibility for such initiatives. However, indirect benefactors of rock climbing must be informed of economic data, or agencies responsible for managing climbing sites lose ammunition needed to successfully realize cross-marketing partnerships. Ultimately, as physical space becomes viewed as a commodity, preferentialism is bestowed, and land that was once perceived as 'invisible' emerges to the forefront.

Destination tourism

Aesthetics, novelty, and variety emerged as the most valuable assets sought out by climbers, while free access and proximity to city amenities ranked lowest. This establishes climbers as a discerning clientele who select destinations based on geographical assets and variety more so than cost and entertainment. Minimal fees associated with accessing climbing sites may not act as a constraint to climbers. Further, sites which are closer in proximity to cities may not be more desirable than sites in remote settings. This offers promise for rural regions that could seek to commodify their resources and become tourism destinations in their own right (Cross 2001; Teodorescu et al. 2012). In fact, the SCC director has made presentations to rural county mayors since the drafting of this economic impact report (C. Roney, personal communication, 7 March 2017), as they seek ways to attract climber travel to their lesser known sites.

Those who climb less in a particular area tend to care more about the destination assets than regular visitors. This could be an issue of expectations and site selection. Once climbers have been to an area, they tend to adjust their expectations to the site's given characteristics. Additionally, climbers will frequent sites that have their desired site characteristics. However, if the goal is to attract tourists to a certain destination, adequate signage, easy access and pain-free registration, as well as the development of crags closer to the city should be priorities. The impact of attraction density (i.e. close proximity to other tourist attractions) on the climbing economy of Chattanooga remains unclear. However, nearby restaurants and entertainment certainly influence spending patterns of users at climbing sites, and rural climbing destinations (e.g. Red River Gorge, KY) are making efforts to increase spending opportunities in their area (Maples et al. 2017). Chattanooga has not progressed to the 'development' phase of tourism (Butler 1980) solely because of its climbing assets, and the plausibility of climbing tourism to facilitate such growth remains dubious.

Management and sustainability

Climbers in Chattanooga clearly express a level of ownership over the climbing areas and agendas. Their commitment to site development and management is a grassroots success story. To this point, the lack of governmental support has largely been viewed cynically,

leaving outdoor athletes feeling like little more than photo opportunities for the visitor's bureau (Cook 2015a). However, the level of grassroots ownership expressed by the climbers in this study represents an asset that may not have developed with governmental funding and oversight. Managers should seek to capitalize on the established culture, to maximize volunteer services on public lands. A more participative management approach could enhance the feeling of community ownership through inclusion in policy-making and enforcement (Bello, Carr, and Lovelock 2016). This currently happens on an ad-hoc basis, with the SCC and Access Fund drafting unique, one-off contracts for each new project (e.g. land acquisitions, trail building, parking lot development, etc.). A long-term participative relationship could benefit all parties.

Land managers should not expect to receive services and support entirely free of charge, either. Climbers expressed a willingness to expand parking lot donations, and were not vehemently opposed to parking fees or reduced maintenance. The vast majority of climbers (95%) would be willing to pay a fee for climbing access, with 62% expressing a willingness to pay \$5 a day. Anecdotal feedback expressed while taking the surveys, though, indicated that they would only do so if the fees were largely 'earmarked' for climbing maintenance. This may be indicative of resentment stemming from the current situation at the Stone Fort Bouldering area; the only privately-owned location in our study. While the owner welcomes over 12,000 climbers onto his property annually at US\$9 each, he still relies on the SCC to maintain the trails and signage during volunteer days. This may also explain the opposition to selling off climbing areas to private companies. Though few differences emerged from the data, visitors were more open to donations and parking fees than residents in this study. Policies established in this regard should recognize the added complexity in managing spaces for local recreation and tourism (Bailey, Kang, and Lewis 2017).

Mandatory fees at climbing sites are not uncommon, despite concerns about liability associated with fee-based services. However, 'pay-to-play' agreements typically come with improved amenities, such as restrooms, water access, well-developed trails and even emergency first aid stations. This generates consistent revenue for land managers and better access for users, and encourages buy-in from managing agencies. For instance, the Georgia Outdoor Recreation Pass is now required for entry to Rocktown (US\$6/weekend or US\$19/year). When the road to Rocktown was recently washed out, state agencies were quick to act, as the closure directly influenced their bottom line, and they could justify the repair expenses based on revenues.

Conclusions

Nature-based sports and adventure tourism represent an increasingly popular market niche that can significantly influence the local economy. Historically, adventure athletes have been tolerated but not courted, likely due to misconstrued stereotypes based on anecdotal evidence. Additionally, outdoor recreationists have been slow to establish their case for inclusion at the economic 'table.' With the rise of national reports on the economics of the outdoor industry (OIA 2017) and recent signing into law of the Recreation's Economic Contribution (REC) Act in the USA (Beyer 2016), the impact of outdoor recreation is receiving due credit. Even so, national statistics do not always influence local politics. Objective, local impact reports must supplement the broader narrative to

induce change. Accordingly, regional research is needed to guide the growth and development of nature-based sports tourism, while sustainably and responsibly managing outdoor recreation areas for local citizens (Bailey, Kang, and Lewis 2017). Utilizing non-profits and grassroots initiatives to draft and enforce policies will ensure that all stakeholders have a voice and will encourage those who are most passionate about the activity and the place.

In summary, analyses attempting to engender positive change in the minds of policy makers cannot begin and end with mere economic impact reporting. Rather, future research which examines the implementation of plans and policies that originated from economic analysis is also necessary. For instance, this study not only highlighted the lucrative nature inherent with rock climbing tourism, but also attempted to delineate how and where private and public land operators should best respond to ensure its sustainability. Research that builds upon this premise is paramount to partnerships with land management organizations and accountability of economic data. As Olmstead (1865) professed, community members and government officials have pertinent roles to play in sustaining natural resource recreation through appropriate commodification, conservation, and management. Therefore, future research demonstrating the effectiveness of budgetary planning and resource allocation is warranted to evaluate their effectiveness and to inform other community inquisitions.

Disclosure statement

No potential conflict of interest was reported by the authors.

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References

- Bailey, A. W., H. K. Kang, and T. G. Lewis. 2017. "Outdoor Recreation and Adventure Tourism: Unique but Allied Industries." *Journal of Outdoor Recreation, Education, and Leadership* 9 (2): 244–247. doi:10.18666/JOREL-2017-V9-I2-8262.
- Beardsley, W. G. 1971. "The Economic Impact of Recreation Development: A Synopsis." In *Recreation Symposium Proceedings*. N. E. For. Exp. Sta, 28–32. Upper Darby, PA: U.S. Forest Service.
- Bello, F. G., N. Carr, and B. Lovelock. 2016. "Community Participation Framework for Protected Area-based Tourism Planning." *Tourism Planning & Development* 13 (4): 469–485. doi:10.1080/21568316.2015.1136838.
- Beyer, D. 2016. "H.R.4665 - 114th Congress (2015–2016): Outdoor Recreation Jobs and Economic Impact Act of 2016 [webpage]." December 8. Accessed October 16, 2017. <https://www.congress.gov/bill/114th-congress/house-bill/4665>.
- Buhalis, D. 2000. "Marketing the Competitive Destination of the Future." *Tourism Management* 21: 97–116.
- Butler, R. W. 1980. "The Concept of a Tourist Area Cycle of Evolution: Implications for Management Resources." *The Canadian Geographer/Le Géographe Canadien* 24 (1): 5–12.

- Carr, E. 2014. "Frederick Law Olmstead: Designing America." <http://www.pbs.org/wned/frederick-law-olmsted/learn-more/olmsted-and-scenic-preservation/>.
- Cook, D. 2015a. "The Best Outdoor City Deserves the Best Public Policy." *Timesfreepress.com*, June 2. <http://www.timesfreepress.com/news/opinion/columns/story/2015/jun/02/best-outdoor-city-deserves-best-public-policy/307371/>.
- Cook, D. 2015b. "Missed opportunities in the Best Outdoor City." *Timesfreepress.com*, June 14. <http://www.timesfreepress.com/news/opinion/columns/story/2015/jun/14/missed-opportunities-best-outdoor-city/309516/>.
- Cook, D. 2017. "Is More Publicity Good for Chattanooga's Beautiful Natural Areas? | Times Free Press." April 30 <http://www.timesfreepress.com/news/opinion/columns/story/2017/apr/30/road-more-traveled/425550/>.
- Crompton, J. L. 2006. "Economic Impact Studies: Instruments for Political Shenanigans?" *Journal of Travel Research* 45: 67–82.
- Crompton, J. L. 2007. *Community Benefits and Repositioning: The Keys to Park and Recreation's Future Viability*. Ashburn, VA: National Recreation and Park Association.
- Crompton, J. L. 2011. *Measuring the Economic Impact of Park and Recreation Services*. Ashburn, VA: National Recreation and Park Association.
- Cross, J. E. 2001. "What is 'Sense of Place'?" Paper presented at the archives of the twelfth headwaters conference. http://www.western.edu/headwaters/archivesheadwaters12_papers/cross_paper.html.
- Culhane, P. J. 2013. *Public Lands Politics: Interest Group Influence on the Forest Service and the Bureau of Land Management*. New York, NY: Routledge.
- Cullinane, T. C., and L. Koontz. 2017. 2016 *National Park Visitor Spending Effects: Economic Contributions to Local Communities, States, and the Nation*. Natural Resource Report. Fort Collins, CO: National Park Service.
- Davis, S. 2016. "Chattanooga: America's New Climbing Capitol." *Climbing Magazine*, June 28. <https://www.climbing.com/places/chattanooga-americas-new-climbing-capitol/>.
- Day, G. S., and R. Wensley. 1988. "Assessing Advantage: A Framework for Diagnosing Competitive Superiority." *Journal of Marketing* 52: 31–44.
- Flessner, D. 2016. "Tourism Pumped \$1 Billion into Chattanooga Economy in 2015 | Times Free Press." *Chattanooga Times Free Press*, August 31. <http://www.timesfreepress.com/news/local/story/2016/aug/31/tourism-tops-1-billiamiltcounty/384253/>.
- Frank, J. 2012. "Signal Mountain Considers Lifting Ban on Rock Climbing." *The Chattanooga*, November 30. <http://www.chattanooga.com/2012/11/30/239632/Signal-Mountain-Considers-Lifting-Ban.aspx>.
- Harnik, P., and J. L. Crompton. 2014. "Measuring the Total Economic Value of a Park System to a Community." *Managing Leisure* 19 (3): 188–211.
- Howe, C. W. 1979. *Natural Resource Economics*. New York, NY: John Wiley and Sons.
- Jago, L., L. Chalip, G. Brown, T. Mules, and S. Ali. 2003. "Building Events into Destination Branding: Insights from Experts." *Event Management* 8 (1): 3–14.
- Jansson, M., and T. Lindgren. 2012. "A Review of the Concept "Management" in Relation to Urban Landscapes and Green Spaces: Toward a Holistic Understanding." *Urban Forestry & Urban Greening* 11 (2): 139–145. doi:10.1016/j.ufug.2012.01.004.
- Jeong, J. Y., and J. L. Crompton. 2015. "Measuring the Economic Impact of a State Park System." *Managing Sport and Leisure* 20 (4): 238–257.
- Kaczynski, A. T., J. L. Crompton, and J. E. Emerson. 2003. "A Procedure for Improving the Accuracy of Visitor Counts at State Parks." *Journal of Park and Recreation Administration* 21 (3): 140–151.
- Kil, N., S. M. Holland, and T. V. Stein. 2014. "Structural Relationships Between Environmental Attitudes, Recreation Motivations, and Environmentally Responsible Behaviors." *Journal of Outdoor Recreation and Tourism* 7–8 (Supplement C): 16–25. doi:10.1016/j.jort.2014.09.010.
- Kotler, P., D. H. Haider, and I. Rein. 1993. *Marketing Place: Attracting Investment, Industry, and Tourism to Cities, States, and Nations*. New York; Toronto: Free Press; Maxwell Macmillan Canada; Maxwell Macmillan International.

- Maples, J. N., and M. J. Bradley. 2017. "Economic Impact of Rock Climbing in the Nantahala and Pisgah National Forests." https://www.accessfund.org/uploads/OA_NPNF_ClimbingStudy_Oct-2017-FINAL.pdf.
- Maples, J. N., B. G. Clark, R. Sharp, B. Gillespie, and K. Gerlaugh. 2017. "Climbing Out of Poverty: The Economic Impact of Rock Climbing in and Round Eastern Kentucky's Red River Gorge." *Journal of Appalachian Studies* 23 (1): 53–71.
- Neimark, J. 2016. "The EPA Once Said this was the Dirtiest City in America. Now it's One of Our Greenest." *GOOD Magazine*, July 13. <https://www.good.is/articles/chattanooga-dirty-to-green-city>.
- Newsome, D., S. A. Moore, and R. K. Dowling. 2012. *Natural Area Tourism: Ecology, Impacts and Management*. Tonawanda, NY: Channel View Publications.
- OIA [Outdoor Industry Association]. 2016. *Outdoor Recreation Participation*. Topline Report. Boulder, CO: Outdoor Foundation. <https://outdoorindustry.org/resource/outdoor-participation-report-2016/>.
- OIA [Outdoor Industry Association]. 2017. *The Outdoor Recreation Economy*. Boulder, CO: Outdoor Foundation. https://outdoorindustry.org/wp-content/uploads/2017/04/OIA_RecEconomy_FINAL_Single.pdf.
- Olmstead, F. L. 1865. *Yosemite and Mariposa Grove: A Preliminary Report*. Yosemite National Park, CA: Yosemite Association.
- O'Neil, C. 2012. "Chattanooga Tourism Officials Want Growth Trend to Continue." *Timesfreepress.com*, April 15. <http://www.timesfreepress.com/news/business/aroundregion/story/2012/apr/15/destination-chattanooga/75552/>.
- Pike, S. D. 2002. "Destination Image Analysis – A Review of 142 Papers from 1973 to 2000." *Tourism Management* 23 (5): 541–549.
- Plummer, R., and D. A. Fennell. 2009. "Managing Protected Areas for Sustainable Tourism: Prospects for Adaptive Co-Management." *Journal of Sustainable Tourism* 17 (2): 149–168. doi:10.1080/09669580802359301.
- Sims, C. B., and D. G. Hodges. 2004. *Use, Demographics, and Economic Impacts of Rock Climbing in the Obed Wild and Scenic River Area*. Final Report submitted to National Park Service.
- Smith, J. W., C. Siderelis, and R. L. Moore. 2010. "The Effects of Place Attachment, Hypothetical Site Modifications and Use Levels on Recreation Behavior." *Journal of Leisure Research* 42 (4): 621–640.
- Somin, I. 2014. *Libertarianism and Federalism*. SSRN Scholarly Paper No. ID 2507519. Rochester, NY: Social Science Research Network. <https://papers.ssrn.com/abstract=2507519>.
- Tanner, J. 2017. "How Chattanooga Became a Premier City for Ironman." *Timesfreepress.com*, September 3. <http://www.timesfreepress.com/news/local/story/2017/sep/03/how-chattanooga-became-premier-city-ironman/446966/>.
- Taylor, D. T., A. Nagler, C. T. Bastian, and T. Foulke. 2013. *The Economic Impact of Non-motorized Trail Usage on National Forests in Wyoming*. Laramie, WY: University of Wyoming.
- Teodorescu, N., A. Stancioiu, A. Botos, O. Arsene, and C. Ditoiu. 2012. "Means of Assessing a Sport Tourism Destination's Competitive Advantage Sources." *Journal of Physical Education and Sport* 12 (4): 498–506.
- USNPS. n.d. "Estimating Denali's Visitation (U.S. National Park Service)." Accessed February 13, 2018. <https://www.nps.gov/articles/denali-visitor-estimation.htm>.
- Williams, D. R., M. E. Patterson, J. W. Roggenbuck, and A. E. Watson. 1992. "Beyond the Commodity Metaphor: Examining Emotional and Symbolic Attachment to Place." *Leisure Sciences* 14: 29–46.
- Williams, D. R., and J. W. Roggenbuck. 1989. "Measuring Place Attachment: Some Preliminary Results." In *Abstracts: 1989 Leisure Research Symposium*, edited by L. H. McAvoy and D. Howard, 32–39. Arlington, VA: National Recreation and Park Association.