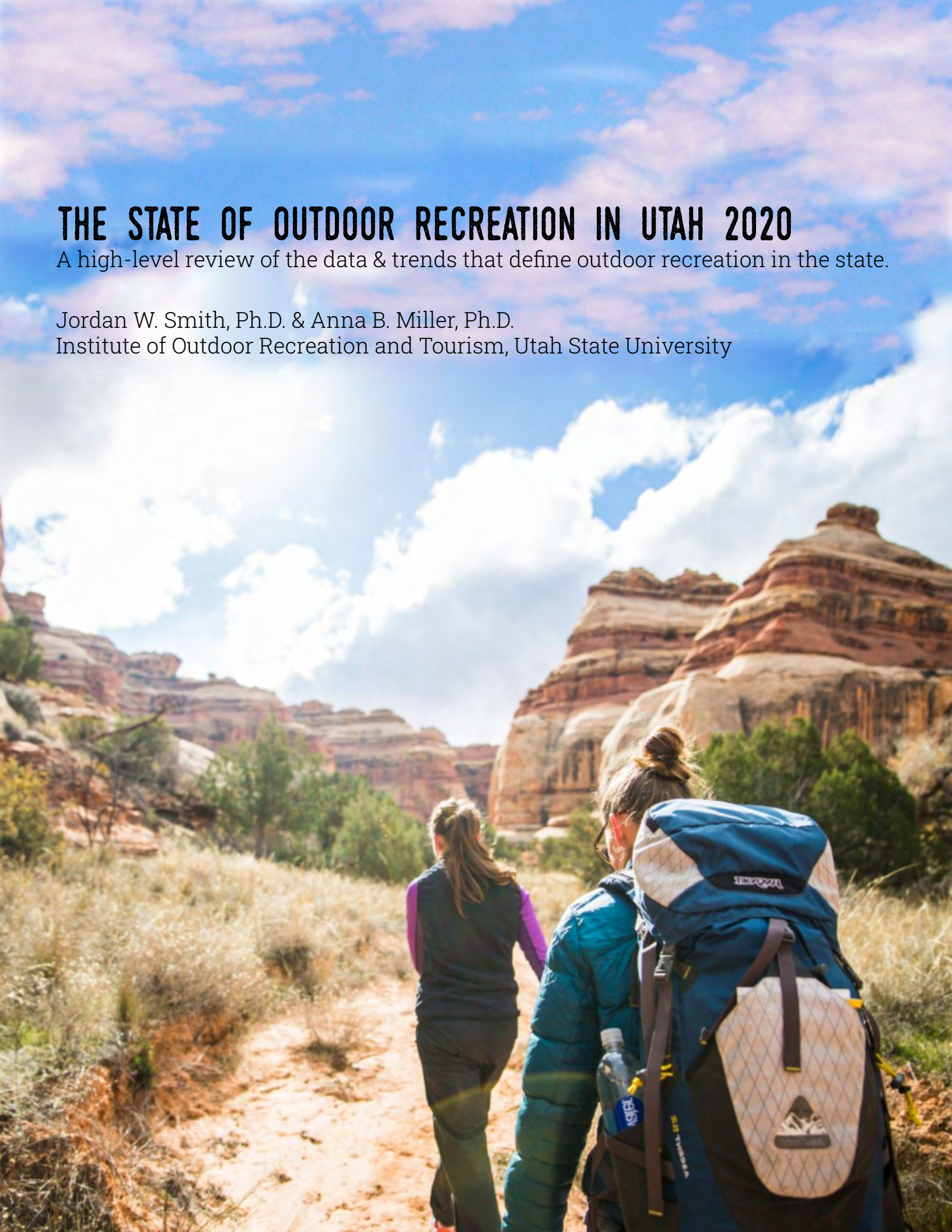


# THE STATE OF OUTDOOR RECREATION IN UTAH 2020

A high-level review of the data & trends that define outdoor recreation in the state.

Jordan W. Smith, Ph.D. & Anna B. Miller, Ph.D.

Institute of Outdoor Recreation and Tourism, Utah State University



## ABOUT THE INSTITUTE

The Institute of Outdoor Recreation and Tourism (IORT) was founded in 1998 by the Utah State Legislature through the Recreation and Tourism Research and Extension Program Act (S.B. 35). It is mandated to focus on: tourism and outdoor recreation use; the social and economic tradeoffs of tourism and outdoor recreation for local communities; and the relationship between outdoor recreation and tourism and public land management practices and policies.

The purpose of the Institute is to provide: better data for the Legislature and state agencies in their decision-making processes on issues relating to tourism and outdoor recreation; a base of information and expertise to assist community officials as they attempt to balance the economic, social, and environmental tradeoffs in tourism development; and an interdisciplinary approach of research and study on outdoor recreation and tourism, a complex sector of the state's economy.

The Institute is composed of an interdisciplinary team of scientists with backgrounds in the economic, psychological, social, and spatial sciences. It is led by Dr. Jordan W. Smith (Director), Dr. Anna B. Miller (Assistant Director of Research and Operations), and Chase C. Lamborn (Assistant Director of Outreach and Education). The Institute delivers on its mission through a broad network of Faculty Fellows.

**Jordan W. Smith, Ph.D.**<sup>1</sup>, is the Director of the Institute of Outdoor Recreation and Tourism and an Assistant Professor in the Department of Environment and Society at Utah State University. The Institute of Outdoor Recreation and Tourism produces data, information, and knowledge that will lead to a better understanding of the trade-offs and consequences associated with providing outdoor recreation opportunities on public and private lands.

**Anna B. Miller, Ph.D.**, is the assistant director of research and operations at IORT. She studies recreation ecology and wildlife-based recreation, investigating the interactions between recreation and wildlife in protected areas. She also specializes in geospatial information science, using spatial approaches to understand human-wildlife interactions.

<sup>1</sup> Address all correspondence to [jordan.smith@usu.edu](mailto:jordan.smith@usu.edu)

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Utah State University

**Reviewers:**

Lael Gilbert, Pitt Grewe, Chase C. Lamborn, Tara McKee,  
Patrick Morrison, Emily J. Wilkins, & Hongchao Zhang.

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## INTRODUCTION

From the powder-covered slopes of the northern Wasatch to the red rock wonderland of the state's southern regions, Utah is known around the world for its outstanding outdoor recreation destinations and the unique experiences they provide. With 2.5 million Utahns participating in outdoor recreation each year, it is clear that outdoor recreation is fundamental to who Utahns are, and how they live their lives. If future generations want the same opportunities that are available today, forests, lakes, parks, and rivers within the state need proactive management using the best available data. However, because Utah's outdoor recreation destinations are managed by several different federal and state agencies, there is no comprehensive and consistent information on the amount, types, and consequences of outdoor recreation occurring within the state. This report begins to address this limitation by compiling and synthesizing data that characterize the 'state' of outdoor recreation in Utah. We draw from a diverse array of over a dozen databases to describe not only the amount and types of outdoor recreation occurring within the state, but also the infrastructure on which it depends, the economic impacts of outdoor recreation, and the unique characteristics of gateway and natural amenity region communities that serve as a basecamp for adventures into the state's parks and protected areas.

There are several reasons why a state-level synthesis of key metrics characterizing outdoor recreation within Utah is needed. First, the state's leadership recognizes the vitally important role that outdoor recreation plays in Utahns' quality of life as well as the health of the state's economy. The Utah State Legislature created the first state 'office' of outdoor recreation in 2013. The office has an explicit mandate of "developing data regarding the impacts of outdoor recreation in the state" (Outdoor Recreation Office Act, 2013). It is our hope that through the creation of a state-level synthesis of key metrics characterizing outdoor recreation within Utah, the state's Office of Outdoor Recreation will be more capable of recommending "policies and initiatives to enhance recreational amenities and experiences in the state," another statutory mandate. Second, Utah has an amazingly diverse array of outdoor recreation resources managed by numerous federal and state agencies. These agencies each have a unique mandate, purpose, and ability to monitor and manage outdoor recreation participation. A state-level synthesis of key metrics characterizing outdoor recreation within Utah can help facilitate a shared understanding of the problems and opportunities associated with outdoor recreation management. It is our hope that through a shared understanding, outdoor recreation management, policy, and promotion efforts can be more effectively coordinated across the state. Coordination can help ensure that management, policy, and promotion efforts are complementary and not redundant or counterproductive.





The purpose of this report is to provide a high-level review of the trends that define outdoor recreation within Utah. We do this by distilling data from a variety of sources, focusing on 'key metrics' that can be tracked over time, serving as a finger on the pulse on the health of outdoor recreation within Utah. Data on outdoor recreation participation and its benefits and impacts varies considerably across the state depending upon the managing agency collecting the data (Table 1). This report focuses on statewide data available for outdoor recreation opportunities provided on lands managed by the Bureau of Land Management, National Park Service, US Fish and Wildlife Service, USDA Forest Service, and Utah State Parks. We highlight data unique to administrative units (e.g., national parks or forests) where applicable. The report focuses on four sets of key metrics:

- Participation;
- Economics;
- Infrastructure; and
- Gateway and Natural Amenity Region (GNAR) communities.

The goal of the report is not to be an exhaustive compendium of data and information related to outdoor recreation within the state. Rather, we draw

from existing data sources that are compiled and reported by individual federal and state agencies. These data are often compiled and reported on an annual or periodic basis, with no coordinating effort to understand if, and in which direction, the key metrics are trending over time. This report provides the first synthesis of outdoor recreation metrics not only across different land management agencies, but also across time.

Given the purpose of this report is to guide coordinated policy across the state, we highlight policy, management, and promotion opportunities for each key metric that we define and track. These opportunities provide actionable guidance for state legislators and officials, land management agency staff, leaders from the outdoor recreation industry, non-profit organizations, as well as county and local officials.

Throughout the report we also highlight unique case studies, scientific research, and collaborative projects that are at the forefront of outdoor recreation research. These 'insights' provide illustrative examples of ongoing work throughout the state to better understand the behavior of outdoor recreationists and the trade-offs that come with providing outdoor recreation opportunities on public lands.

**Table 1.** Key metrics defining the state of outdoor recreation in Utah, by agency.

Key metric, by topic area	National Park Service	USDA Forest Service	Bureau of Land Management	Utah State Parks
<b>Participation</b>				
- Visitation	Recreation visits	Forest visits *	No consistent data available statewide	State park visits
- Activity participation	No consistent data available statewide	Participation rates	No consistent data available statewide	No consistent data available statewide
- Socio-demographics	No consistent data available statewide	Age, gender, and race/ethnicity *	No consistent data available statewide	No consistent data available statewide
<b>Economics</b>				
- Economic impact	Visitor spending, value added, economic output, jobs, and labor income	No consistent data available statewide	No consistent data available statewide	No consistent data available statewide
- Economic benefit	No consistent data available statewide	Economic benefit (i.e., net welfare)	No consistent data available statewide	No consistent data available statewide
- Operating budgets	No consistent data available statewide	No consistent data available statewide	No consistent data available statewide	Operating budget and expenditures
<b>Infrastructure</b>				
- Trails	Length and length per capita **	Length and length per capita **	Length and length per capita **	Length and length per capita **
<b>Gateway and Natural Amenity Region Communities</b>				
- Mobility	Proportion of the workforce using public transportation to commute to work			
- Economic diversity	Proportion of the workforce employed in: agriculture, forestry, fishing, and mining industries; the finance and insurance,			
- Health insurance	Proportion of the population with health insurance			
- Income	Median, mean, and per capita income			
- Employment	Proportion of the population employed in the labor force			

**Note.** \* Total annual traffic volume data are also a consistent indicator of outdoor recreation use when these data are collected on road segments that solely, or primarily, provide access to outdoor recreation opportunities. For example, we report on traffic volume at the entrances to both Big and Little Cottonwood canyons in this report. It is likely that there are other road segments throughout the state, where total annual traffic volume data are a reliable indicator of outdoor recreation use. These segments are not reported here, but may be included in future reports.

\*\* The Utah Trails and Pathways dataset also contains data on designated uses, surface type, trail class, difficulty, and ADA accessibility. These metrics are not reported in this report, but may be included in future reports.

How many people are participating in outdoor recreation on public lands within Utah each year? Are there notable visitation trends at specific parks and forests? And importantly, are those individuals who choose to participate in outdoor recreation reflective of the state's population as a whole, or are there sociodemographic groups that are under- or over-represented? These are all critically important questions that can provide insight into the current state of outdoor recreation in Utah. We address them by tracking several key metrics: 1) the total number of recreation visits to different state and national parks as well as national forests; 2) the proportion of outdoor recreationists who participate in different activities; 3) vehicular traffic volume to select outdoor recreation destinations; and 4) the sociodemographics of outdoor recreationists.

## Visitation

### Utah State Parks

Visitation to Utah's state park system, as a whole, has increased notably since 2013 (Figure 1; [Table S1](#)). In 2019, the Utah Division of Parks and Recreation reported nearly 8 million visits across the 41 units for which visitation is tracked<sup>1</sup>. The annual growth in visitation between 2018 and 2019 was 14.4%, the third largest year-over-year change (2017 and 2015 saw 19.7% and 18.8% increases, respectively).

Visitation data for 2020 have yet to be reported for the entire year. Through October however, the state's parks have already recorded 9.9 million visits - the most ever. In fact, visitation for the first 10 months of 2020 are already 23.9% more than the total number of visits recorded for all of 2019.

This can, in part, be attributable to the fact all national parks within the state were closed to visitors from late March through May. State parks remained open to visitors living within the county where the park was located. Later, this restriction was further eased and parks were opened to visitors living within the region of the state where a park was located.

The most frequently visited state parks in Utah in 2019 were Dead Horse Point (978 thousand visits), Sand Hollow (864 thousand visits), Jordanelle (652 thousand visits), Willard Bay (645 thousand visits), and Antelope Island (529 thousand visits). Visitation to all these parks has been increasing notably since 2013 (Figure 2; [Table S2](#)).

<sup>1</sup> Visitation data is not reported by the Utah Division of Parks and Recreation for Flight Park State Recreation Area, the Historic Union Pacific Rail Trail, or Heritage Park.

### National Park Service

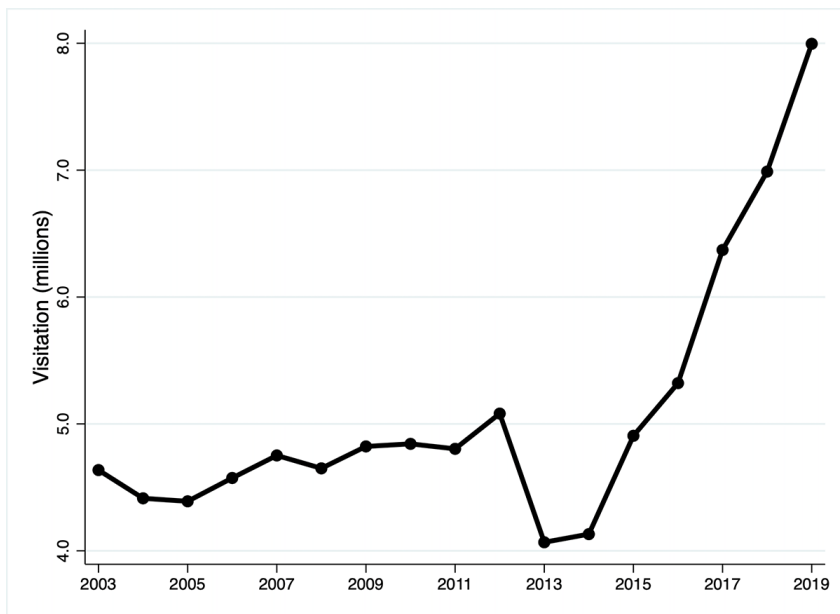
Visitation to National Park Service units within Utah has tended to increase over the past decade (Figure 3; [Table S3](#))<sup>2</sup>. Zion National Park accommodates nearly 2 million more recreation visits each year relative to the next most visited park unit, Bryce Canyon National Park. Zion and Bryce Canyon received 4.48 and 2.59 million visits in 2019 respectively. Since 2012, visitation to Zion has increased by 7.3% each year, a trend that has made it the 16th most visited national park in the country. Notably, the annual rate of increase in visitation to Bryce Canyon has outpaced Zion. The trails and overlooks throughout Bryce's hoodoos have accommodated an average of 12.5% more recreation visits each year since 2012. Visitation to Arches, Capitol Reef, and Canyonlands is also increasing each year, but at smaller rates (7.9%, 11.7%, and 8.9% respectively).

As might be expected, visitation to the state's five national monuments managed by the National Park Service<sup>3</sup> is only a fraction of that experienced by the state's national parks. Amongst the national monuments, Rainbow Bridge National Monument accommodated the most recreation visit—115 thousand—in 2019. Visitation to Rainbow Bridge has increased by an average of 7.6% each year since 2012, a growth rate on par with the state's national parks. Visitation to Timpangos Cave, Natural Bridges, Dinosaur, and Hovenweep National Monuments has remained relatively consistent over the past seven years (annual change in visitation: -1.8% to 4.7%). In total, visits to National Park Service units in Utah made up 4.7% of the 327 million nation-wide visits in 2019.

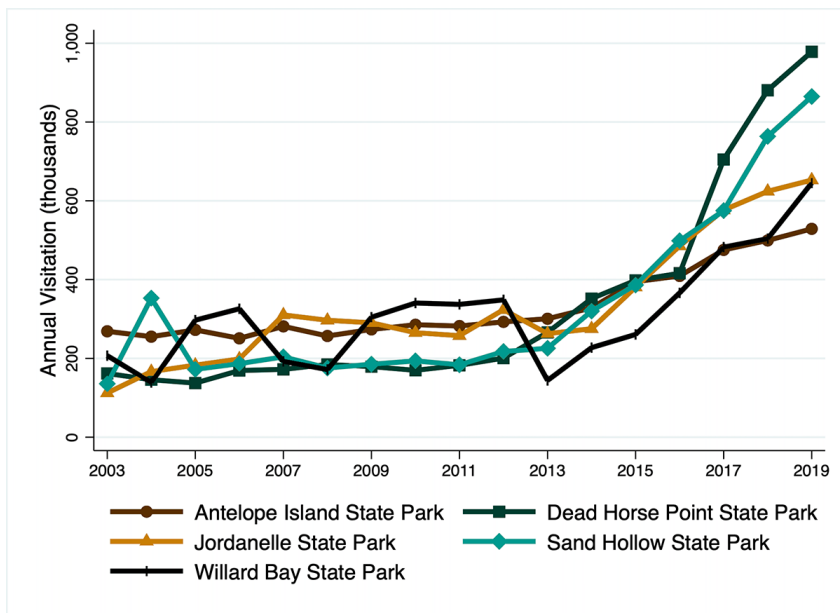
As visitation to National Park Service units within the states continues to rise, visitors' spatial behavior (i.e., which trails and resources people are visiting) within the parks is changing as well. These changes can be driven by the increased density on popular trails as well as the changing environmental conditions within the park. For example, recent research using mobile location data has found significantly different patterns of behavior within the park on exceptionally hot and cold days (see Insight Box 1).

<sup>2</sup> We show data from 2012-2019 in the figures. Historical data (from 1979) for all 11 National Park Service units within Utah are provided in Table S3.

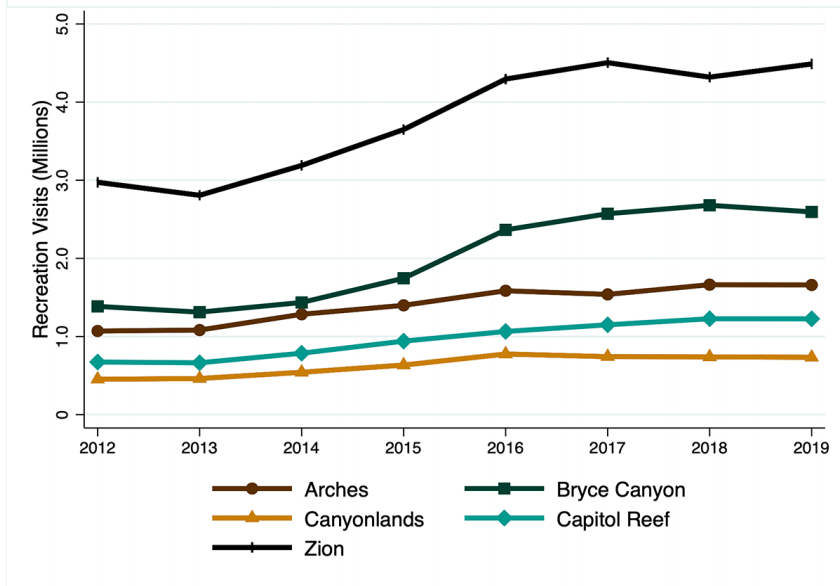
<sup>3</sup> Both Grand Staircase-Escalante National Monument and Bears Ears National Monument are managed by the Bureau of Land Management, which does not have an established visitor use monitoring system. Consequently, these two monuments are excluded from our temporal analysis of visitation to national monuments here.



**Figure 1.** Recreation visits to Utah state parks (2003-2019). Data: Utah Division of Parks and Recreation.



**Figure 2.** Recreation visits to Utah's five most visited state parks (2013-2019). Data: Utah Division of Parks and Recreation.



**Figure 3.** Recreation visits to Utah's five national parks (2012-2019). Historical visitation data (1979-2019) is provided in Table S3. Data: National Park Service.



## The influence of weather on the spatial behavior of visitors within Utah national parks

When people post personal photos on social media, these images often contain information on the location, time, and date the photo was taken. This information can be used to extrapolate patterns and trends of Utah's recreationists. For example, using geotagged images from Flickr, we examined how summer visitors to Utah's national parks vary locations within the park based on the daily weather.

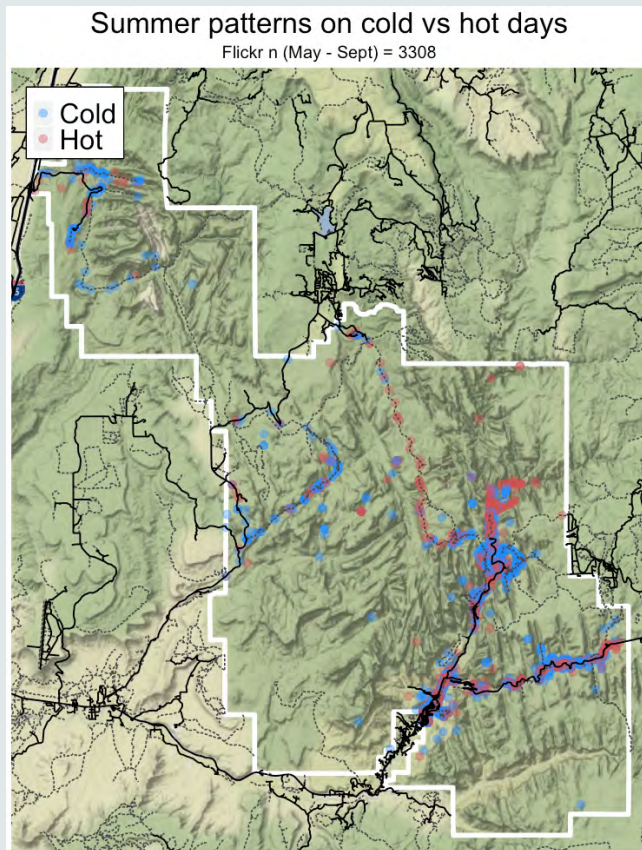
In summer months (May–September), visitors to Utah's national parks were more likely to venture further from roads on colder summer days, and more likely to stay closer to roads on hotter days. Cold days are defined as days that are one standard deviation below the park-specific temperature mean, while hot days are those that are one standard deviation above the mean. On days with precipitation, visitors were more likely to stay closer to roads and parking areas. Table I2 provides a summary of how visitors' elevations and distances from roads, waterbodies, parking areas, and buildings vary in each park based on daily temperature and precipitation. For instance, in Zion, the mean distance from a road was 59 m on cold days, 64 m on average days, and 52 m on hot days (Figure I2). Maps showing spatial behavior of visitors in each park can be found online at <https://doi.org/10.3886/E119191V1>.

As the climate continues to warm and there are more hot days each season, the places people visit in parks are likely to change. On particularly hot summer days, visitors to Canyonlands and Capitol Reef may seek colder temperatures at higher elevations. Visitors to Zion may head to lower elevations, possibly seeking comparatively cooler temperatures in canyons, or cooling off near water bodies. On hot days summer visitors may be less inclined to go on long hikes, and more likely to stay close to their cars. Regardless of the weather, visitors tended to stay close to roads, with a median distance from a road ranging from 18 m (Capitol Reef) to 59 m (Canyonlands). This suggests that increasing infrastructure near parking areas and roads (e.g., pull-offs for scenic viewpoints; interpretive signs near roads and parking areas) may help accommodate increasing visitation, particularly as temperatures continue to rise.

Selected findings reported from Wilkins et al. (in press).

**Emily J. Wilkins, Ph.D.**, Postdoctoral Research Associate, Institute of Outdoor Recreation and Tourism, ([emily.wilkins@aggiemail.usu.edu](mailto:emily.wilkins@aggiemail.usu.edu))

**Jordan W. Smith, Ph.D.**, Director, Institute of Outdoor Recreation and Tourism, Utah State University



**Figure I1.** Differences in visitors' spatial behavior on extremely hot and cold days within Zion National Park.

## USDA Forest Service

Seven national forests (Ashley, Caribou-Targhee, Dixie, Fishlake, Manti-LaSal, Sawtooth, and the Uinta-Wasatch-Cache) are either entirely or partially within Utah. The Uinta-Wasatch-Cache National Forest is far and away the most visited forest within the state (Figure 4, [Table S4](#)). In 2017, the most recent year for which visitation was reported, the portion of the Uinta-Wasatch-Cache within Utah experienced 7.6 million visits. Notably, visitation to the Uinta-Wasatch-Cache is consistently increasing. The period between 2007 and 2017 saw forest visits within Utah increase by 1.6 million, an average annual increase of 2.6%. If this current rate of growth continues, the portions of the Uinta-Wasatch-Cache National Forest in Utah will see over 8.1 million forest visits in 2020 and 10 million forest visits by 2028. The Uinta-Wasatch-Cache National Forest alone hosted 5.1% of the 149 million national forest visits across the country in 2017 (USDA Forest Service, 2017).

One of the primary drivers for the increase in visitation to the Uinta-Wasatch-Cache National Forest is the similarly rapid increase in population along the Wasatch Front. Collectively, the populations of Davis, Salt Lake, Utah, and Weber counties are growing at 1.64% a year ([Table S5](#)). It is worth noting that recreational use of the Uinta-Wasatch-Cache is increasing faster than the local population is growing. This suggests local populations are becoming more avid recreationists. This is likely the case as the proportion of visitors to the Uinta-Wasatch-Cache who reported recreating on the forest more than 10 times a year increased from 50.5% in 2012 to 58.4% in 2017 (similarly, the proportion of forest visitors who reported coming less than 10 times a year went down by 8 percentage points over the same period).

The influence of the Uinta-Wasatch-Cache's proximity to Utah's most populous cities and counties on forest visitation can also be seen in vehicular traffic data for roads primarily used for accessing outdoor recreation opportunities. Traffic data from the mouths of both Big and Little Cottonwood Canyons show a marked increase in traffic volume over the past decade (Figure 6).

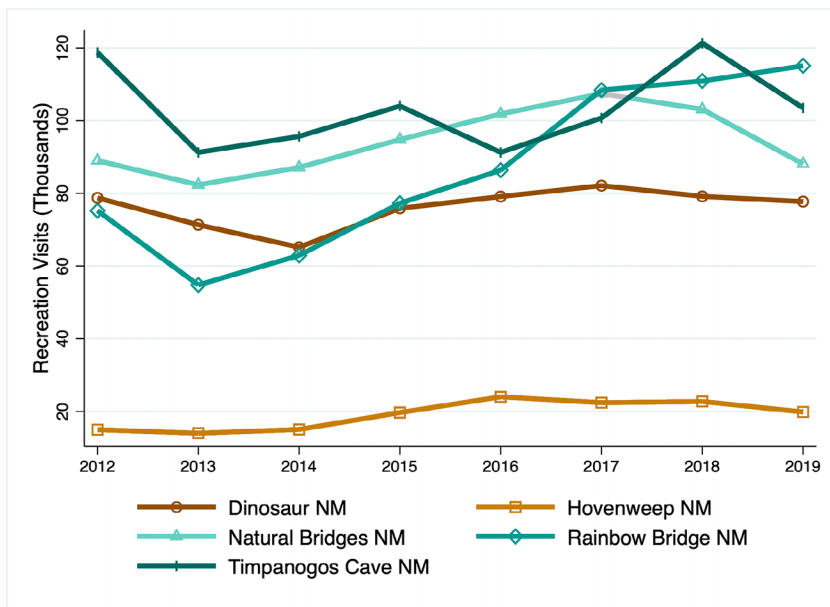
Similar to the Uinta-Wasatch-Cache, visitation to the Dixie National Forest is increasing; up from 561 thousand in 2009 to 735 thousand in 2019, a 3.1% average annual increase (Figure 7). Washington County, home to St. George, is one of the fastest growing counties in Utah, growing by 2.75% a year since 2010 ([Table S5](#)). The rising demand for outdoor recreation opportunities on both the Uinta-Wasatch-Cache and the Dixie coincides with rapidly growing populations in nearby urban areas.

Other national forests within Utah have experienced a uniquely different trend in recreation visitation relative to the Uinta-Wasatch-Cache and Dixie (Figure 7). Visitation to the Ashley, Fishlake, and Manti-LaSal National Forests, which are surrounded by more rural communities, has decreased slightly over the past 15 years. Only very small proportions of the Caribou-Targhee (0.03%) and the Sawtooth (0.04%) National Forests are within Utah's boundaries. Consequently, both of these national forests only contribute a marginal proportion of the total number of forest visits within the state.

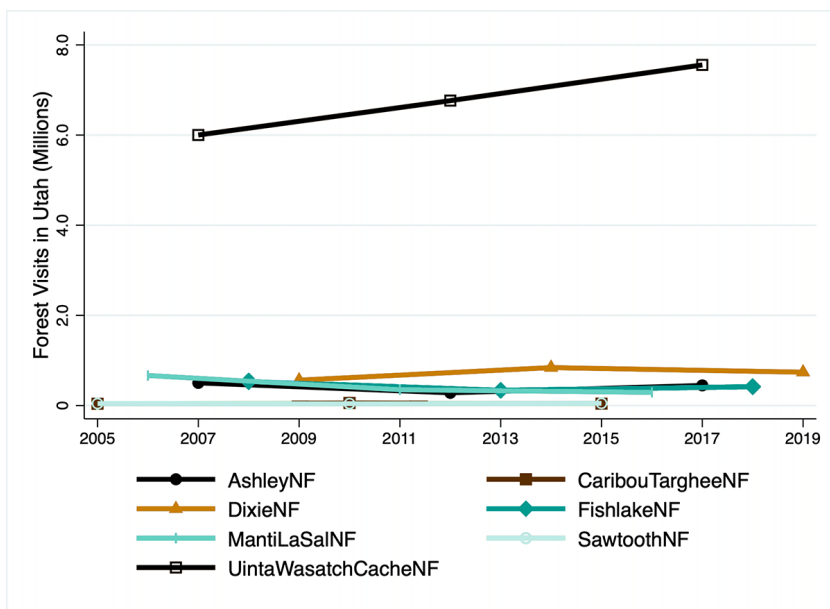
## Activity Participation Across National Forests

Utah's national forests support a remarkable diversity of outdoor recreation activities. Perhaps unique to other western states given the geographic and ecological diversity within Utah, the dominant recreational activities occurring in each national forest are relatively unique (Figure 8, [Table S6](#)). Hiking/walking and downhill skiing are by far the most common recreational activities occurring on the Uinta-Wasatch-Cache and Dixie National Forests. This trend is attributable, in part, to these forests' proximity to large population centers (the Wasatch Front for the Uinta-Wasatch-Cache and St. George and Cedar City for the Dixie National Forest), and their developed ski areas. Even with the three-hour drive, Las Vegas, NV residents frequently travel to Brian Head Ski Resort, which likely accounts for downhill skiing being a dominant activity on the Dixie.

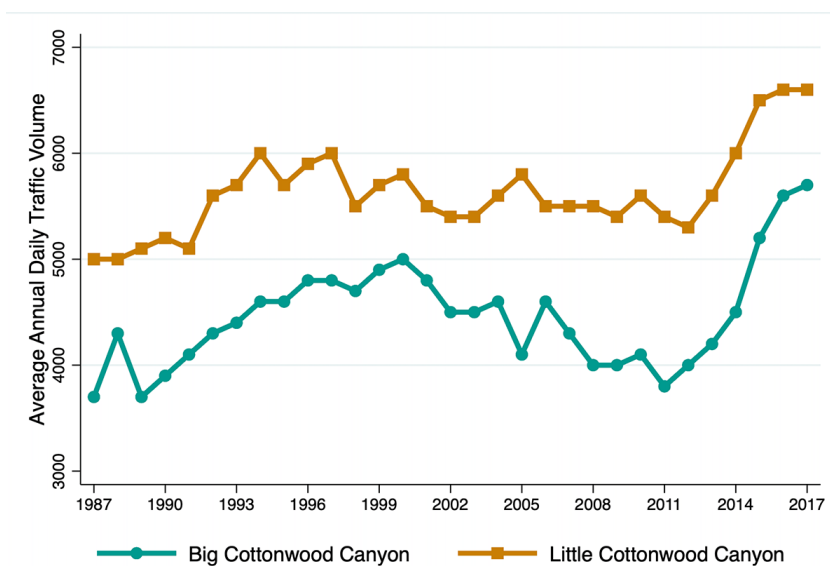
There are some commonalities in the dominant activities occurring across all the national forests in Utah. Notably, fishing and hunting are both among the most common activities occurring on Utah's national forests. Fishing and hunting are the two most common recreational activities on the Fishlake National Forest and the first and third most common recreational activity, respectively, on the Ashley National Forest. Both of these national forests have large water bodies that are a focal point for visitation. Fishlake, the feature the forest is named after, is a large natural lake that provides boating and fishing opportunities in central Utah. Flaming Gorge Reservoir, and the Green River that flows from it, also offer world-class fishing opportunities. With participation in hunting and fishing declining at the national level (U.S. Department of the Interior et al., 2018), providing such opportunities is increasingly important. Furthermore, trends toward increasing maximum daily temperatures are likely to increase the proportion of recreation occurring in and around water bodies (Loomis & Crespi, 2004; Mendelsohn & Markowski, 2004); resources for managing this increase in visitation around these areas should be a priority in the near future. Viewing natural features and driving for pleasure are also consistently among



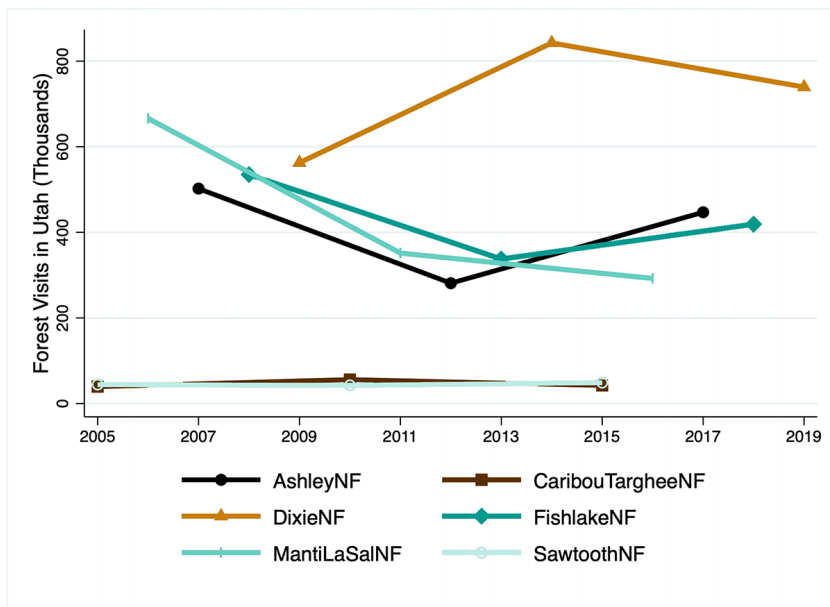
**Figure 4.** Recreation visits to Utah's five national monuments managed by the National Park Service<sup>3</sup> (2012-2019). Visitation data for Dinosaur National Monument (which overlaps the Utah/Colorado border) are adjusted proportional to the amount of that park unit within Utah. Historical visitation data (1979-2019) is provided in Table S3. Data: National Park Service & Institute of Outdoor Recreation and Tourism at Utah State University.



**Figure 5.** Recreation visits to the national forests within Utah (2005-2019). Data: USDA Forest Service & Institute of Outdoor Recreation and Tourism at Utah State University.



**Figure 6.** Average annual daily traffic volume at the entrances of both Big and Little Cottonwood Canyons (1987-2017). Data: Utah Department of Transportation.



**Figure 7.** Recreation visits to the national forests within Utah, excluding the Uinta-Wasatch-Cache National Forest (2005-2019). Forest visits only include those occurring within Utah. This explains the marginal number of visits to the Caribou-Targhee and Sawtooth National Forests. Data: USDA Forest Service & Institute of Outdoor Recreation and Tourism at Utah State University.

the most common activities reported by national forest visitors within Utah.

## Sociodemographics Across National Forests

### Gender

The majority of recreationists on national forests within Utah are female (Figure 9, [Table S7](#)). The Uinta-Wasatch-Cache National Forest has the smallest proportion of female outdoor recreationists (52.8%) relative to the other national forests within the state. Conversely, the Ashley and the Dixie National Forests see the largest proportion of female outdoor recreationists (57.9%).

### Race and Ethnicity

Perhaps unsurprisingly considering the state's demographics, outdoor recreationists in Utah's national forests are predominantly white. The proportion of forest visitors identifying as white ranges from 92.2% for the Manti-LaSal National Forest to 98.1% for the Uinta-Wasatch-Cache National Forest. Visitors who recreate on national forests in Utah are not representative of the state's population as a whole. White individuals are overrepresented, while other racial and ethnic groups tend to be underrepresented (Figure 10, [Table S8](#)). Hispanics and Latinos, as well as Hawaiian or Pacific Islanders, are underrepresented in all five major national forests within Utah, while Asian and Black individuals are underrepresented in all national forests except the Manti-LaSal.

### Age

Among the distinct age groups asked about by the USDA Forest Service in their periodic visitor use monitoring efforts, young individuals (under 16) represent

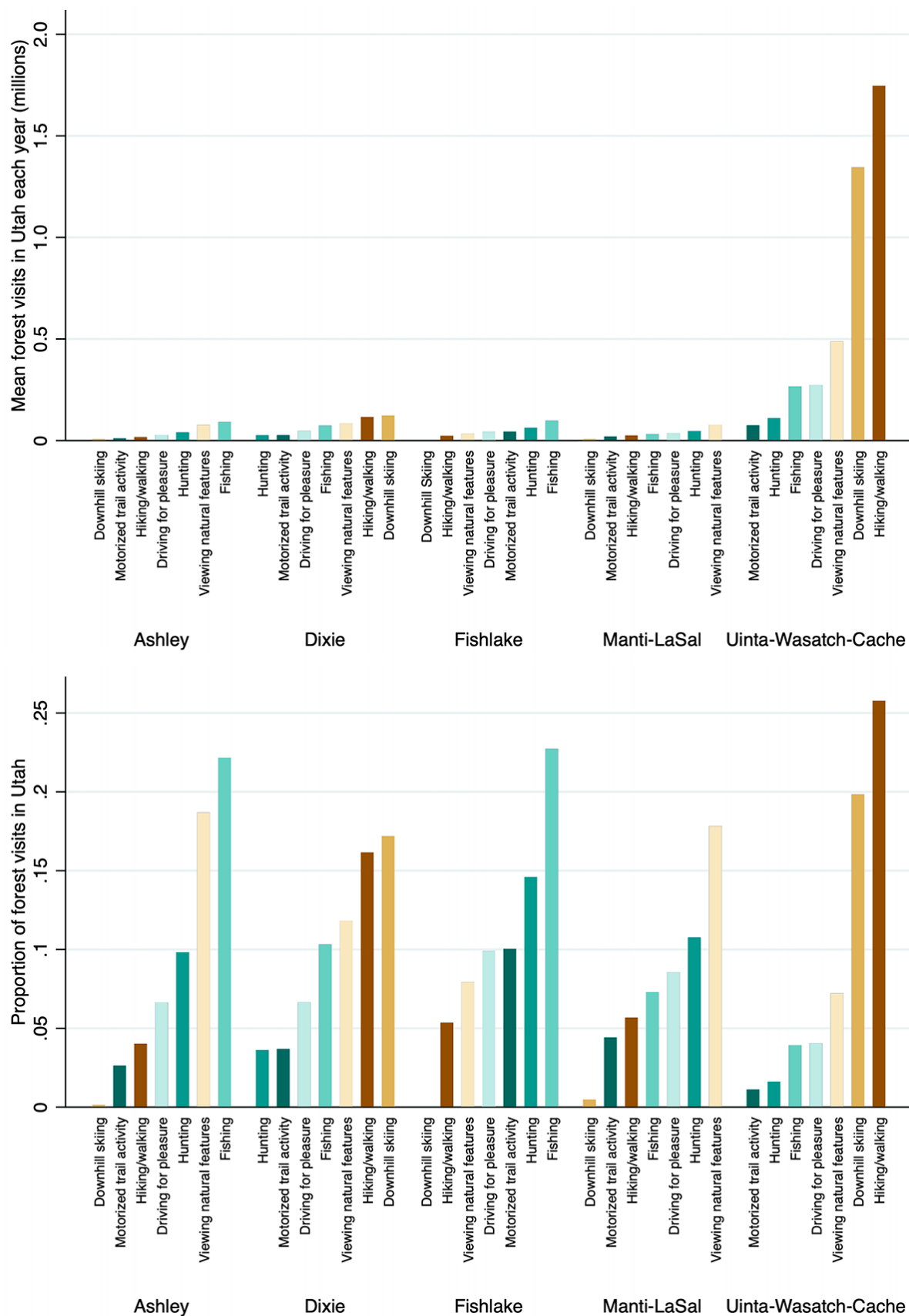
the largest proportion of forest visits (Figure 11, [Table S9](#)). Anywhere between 17.9% (Uinta-Wasatch-Cache National Forest) and 24.2% (Ashley National Forest) of all forest visitors are under the age of 16.

## Data and Research Needs

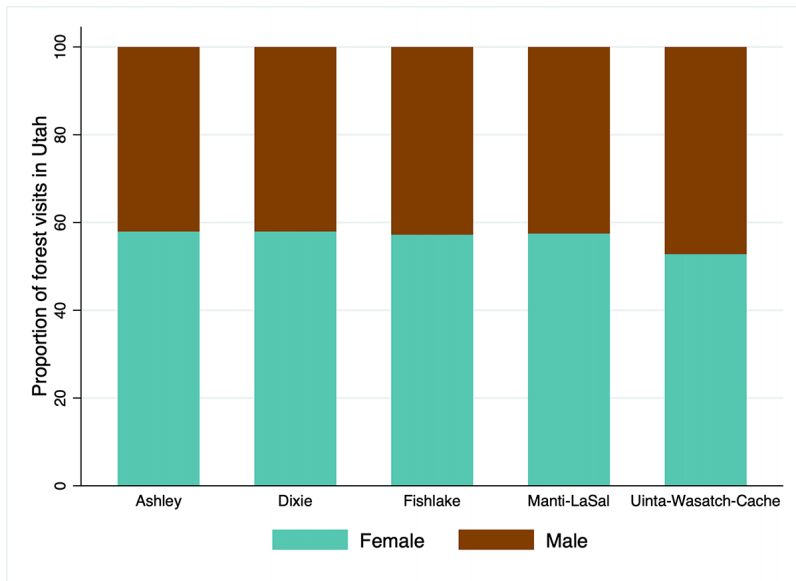
The data presented here represent only a proportion of all the outdoor recreation that is occurring throughout Utah. These data are the product of federal agencies who have invested in ongoing visitor use monitoring efforts. Visitor use monitoring efforts coordinated across agencies is needed to provide a more comprehensive understanding of the amount and diversity of outdoor recreation occurring within the state. Coordination and implementation of visitor use monitoring efforts is beyond the scope of agencies' state or regional offices. Support for federal interagency coordination efforts, such as the Federal Interagency Council on Outdoor Recreation (FICOR), can provide states with a more comprehensive understanding of the types and diversity of outdoor recreation that are occurring within their boundaries.

Additionally, detailed data on visitor use to Utah's state parks could provide a better understanding of how Utahns are using state lands. Current visitation monitoring efforts, which provide an understanding of how many recreation visits the state's park system is receiving, are useful. However, more detailed data on visitors' participation in different activities, their sociodemographic characteristics, and their preferences for management actions, could provide more explicit guidance for managers.

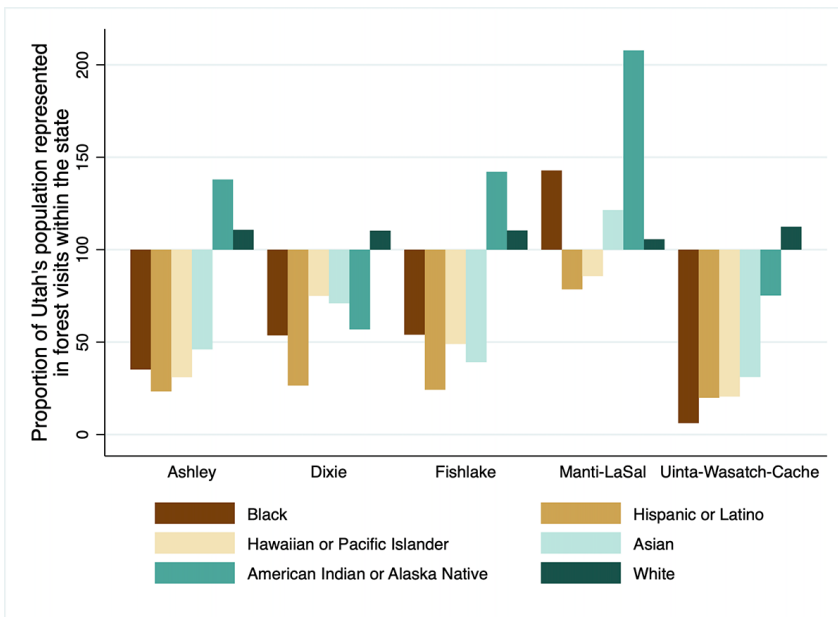




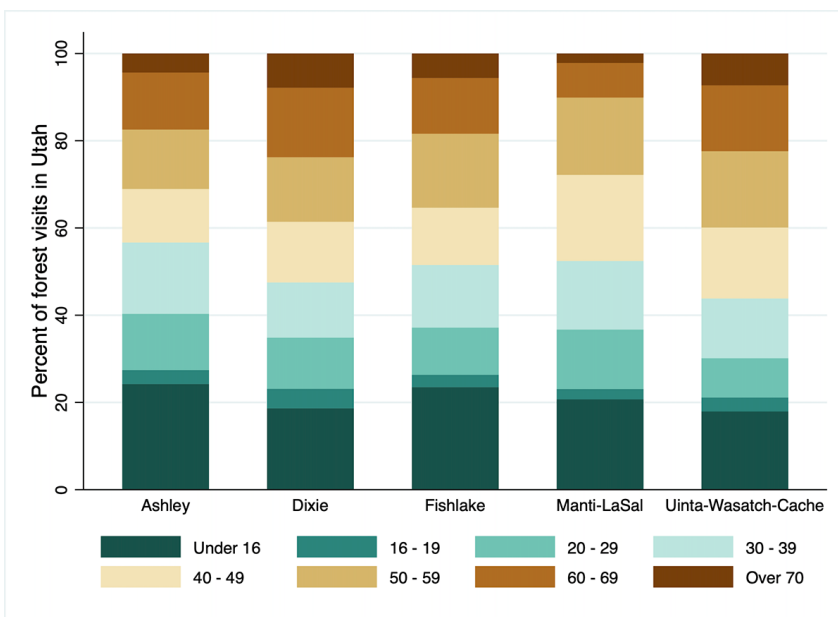
**Figure 8.** Average annual forest visits by primary activity for each of the five major national forests within Utah. Panel A shows mean annual forest visits. Annual forest visits were averaged across the three most recent estimates for each forest; see Table S4 for individual estimates. Forest visits also only include those occurring within Utah's boundaries. Panel B shows the proportion of forest visits by primary activity type. Data: USDA Forest Service & Institute of Outdoor Recreation and Tourism at Utah State University.



**Figure 9.** Gender of outdoor recreationists for each of the five major national forests within Utah. Data: USDA Forest Service.



**Figure 10.** Over and underrepresentation in forest visits by race and ethnicity for the five major national forests within Utah relative to the state's population. Values below 100 indicate the proportion of forest visits by a given racial or ethnic group on a particular national forest are less than that racial or ethnic group's proportion of the state population; the converse is also true. Race and ethnicity are considered distinct by the USDA Forest Service and are asked about differently in visitor intercept surveys; the data are reported on the same figure here for convenience. Data: USDA Forest Service.



**Figure 11.** Age groups of outdoor recreationists for each of the five major national forests within Utah. Data: USDA Forest Service.

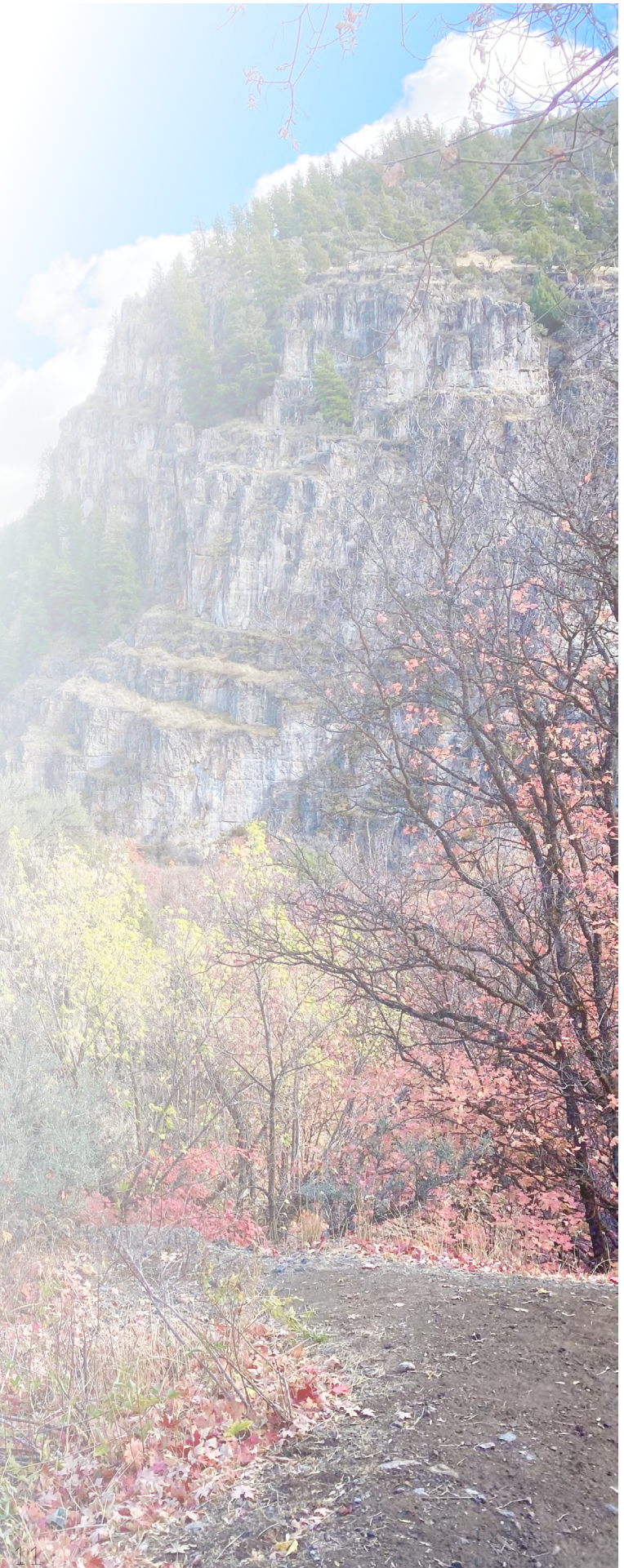


## Implications for Policy, Management, and Promotion

The data presented above shows that, by and large, the use of parks and forests for outdoor recreation is increasing in Utah. The data also suggest that visitation is increasing on public lands closest to urban population centers. More detailed information is needed to provide a better understanding of exactly where visitation is increasing most so that management efforts (e.g., infrastructure development and maintenance efforts) can be effectively targeted. Recent advances in research that leverage the near ubiquitous use of location-enabled devices (see Insight Box 2) can provide this information and be used to inform practical, targeted guidance for managers. State policy that focuses on tapping into the wealth of behavioral data available via mobile devices could yield benefits to multiple constituents across all levels of government in Utah.

Minorities in Utah tend to be underrepresented in outdoor recreation participation. Programs and policies that encourage participation amongst non-white outdoor recreationists are needed. The past decade has seen a concentrated focus on the need for policies, programs, and promotional efforts aimed at reducing the barriers and constraints minority populations face when participating in outdoor recreation. A constellation of coordinated actions amongst multiple advocates for the benefits of outdoor recreation is needed to effectuate change and ensure all Utahns experience the benefits of outdoor recreation.

Utah can be an exemplary state to document the benefits of outdoor recreation and natural landscapes on youth. Utah's unique demographic profile, composed of relatively large nuclear families and a rapidly growing Hispanic and Latino population, means that more youth participate in outdoor recreation within Utah relative to other states. Consequently, state-led policies that leverage the large youth population to increase awareness of, and stewardship for, public lands could be particularly effective.





## Using social media data to measure and map visitation to public lands in Utah

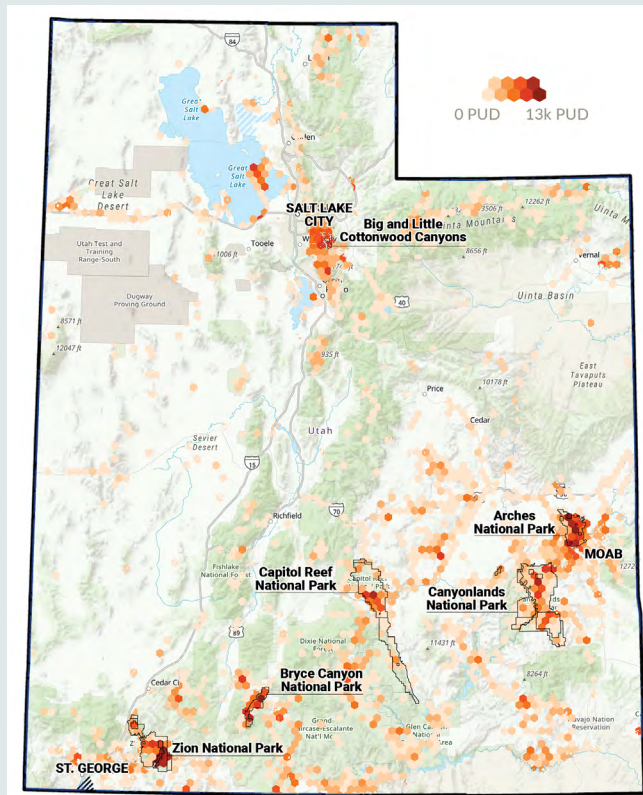
Social media platforms provide publicly available user-generated data that has been used to estimate the volume of use, the spatial distribution of that use, and the experiences of visitors (Wilkins et al., 2020). However, The ability of social media to accurately represent visitation to outdoor recreation destinations across different types of public lands is still not firmly established. We examined the ability of social media to measure and map visitation to public lands managed by different agencies across Utah. We found a significant and positive relationship between social media and reported visitation at National Park Service units and national forests while there is a relatively weak relationship for state parks (Table I1).

The low correlation between social media data and reported state park visitation is likely attributable to: 1) the lack of a sound visitor use monitoring system to estimate visitation for Utah's state parks; and 2) the fact that the attributes and characteristics that attract visitors to state parks differ significantly from the attributes and characteristics that attract visitors to national parks units and national forests. Our analysis shows support for the use of geotagged social media to supplement data collected through traditional means (e.g., on-site counts of visitors) as part of visitor use monitoring protocols.

For some land management agencies that are home to iconic destinations and scenic landscapes that are shared on photo-sharing platforms like Panoramio and Flickr, social media can provide a reliable tool to measure and map visitation. However, for other agencies who manage destinations that are less likely to be shared on social media, using these data as a measure of visitation is tenuous. The use of social media should be approached with caution, with an appreciation that while it may have many benefits relative to traditional visitor use monitoring methods it may not be appropriate in all contexts and for all questions. Our work suggests the questions with which social media are well suited to answer depends on both managerial context (i.e., what types of destinations are being managed) and spatial scale (i.e., what is the scope at which tourism management decisions are being made).

**Hongchao Zhang**, Ph.D. Candidate, Institute of Outdoor Recreation and Tourism, (hongchao.zhang@aggiemail.usu.edu)

**Jordan W. Smith, Ph.D.**, Director, Institute of Outdoor Recreation and Tourism, Utah State University



**Figure 12.** Geotagged social media data showing spatial patterns of visitation to Utah's public lands.



Outdoor recreation is an integral part of Utah's economy. Estimates from the Outdoor Industry Association show outdoor recreation generated \$12.3 billion in consumer spending within the state; this tabulates to \$7,800 per outdoor recreation participant (Outdoor Industry Association, 2017). The amount of money people spend on outdoor recreation within the state supports \$3.9 billion in wages and salaries for Utah workers, and also generates \$737 million in state and local tax revenues. More recent data from the Bureau of Economic Analysis estimated the value of outdoor recreation at 3.3% of state GDP in 2019 (Bureau of Economic Analysis, 2017). This places outdoor recreation in Utah ahead of mining, quarrying, and oil/gas extraction industries (2.1% of 2019 GDP) and just behind transportation and warehousing industries (3.5% of 2019 GDP). While it is clear the value of outdoor recreation to the state as a whole is substantial, the data presented below highlight what we know about how specific recreation resources contribute to the state's economy.

## The Economic Impacts of National Parks Service Units in Utah

While the five national parks in Utah receive the most recreational visits, Glen Canyon NRA actually contributes the most to the state's economy (Figure 12, [Table S10](#)). In 2019, visitors spent \$338.7 million on their trips to Glen Canyon NRA; this generated an additional \$230.4 million in value to the state's economy (0.14% of Utah's 2019 GDP). Visitor spending at Glen Canyon NRA also generated \$398.9 million in local business activity (economic output) in 2019 and supported 4,153 jobs (\$131.7 million in labor income). This is most likely driven by expenditures that support motorized water-based activities (e.g., fueling and maintaining boats). The magnitude of expenditures to support water-based outdoor recreation activities tends to be larger than non-motorized activities, resulting in a large economic impact (Douglas & Harpman, 1995).

When we look at just the five national parks within Utah, visitors to Zion, Bryce Canyon, and Arches all spent over \$200 million during their trips to these parks (Zion: \$258.4 million; Bryce Canyon: \$222.1 million; Arches: \$201.3 million). Visitors to both Capitol Reef and Canyonlands spent notably less, \$89.8 million and \$45.9 million respectively.

Collectively, visitor spending to the five national parks in Utah added over half a billion dollars (\$556.3 million) to the state's economy, 0.34% of the state's GDP ([Tables S10 and S11](#)). The value added from each park individually follows visitor spending, with Zion adding the most to the state's economy (\$177.0 million; 0.11% of Utah GDP), followed by Bryce Canyon (\$147.9 million;

0.09% of Utah GDP), Arches (\$145.4 million; 0.09% of Utah GDP), Capitol Reef (\$56.0 million; 0.03% of Utah GDP), and Canyonlands (\$30.0 million; 0.2% of Utah GDP) (Figure 13).

Visitor spending to national parks within the state supported 12,449 jobs within the state in 2019 ([Table S10](#)). These jobs were again distributed following visitation and visitor spending patterns, with Zion supporting 4,322 jobs, Bryce Canyon and Arches supporting roughly 3,000 jobs, and Capitol Reef and Canyonlands supporting 1,185 and 647 jobs respectively (Figure 13).

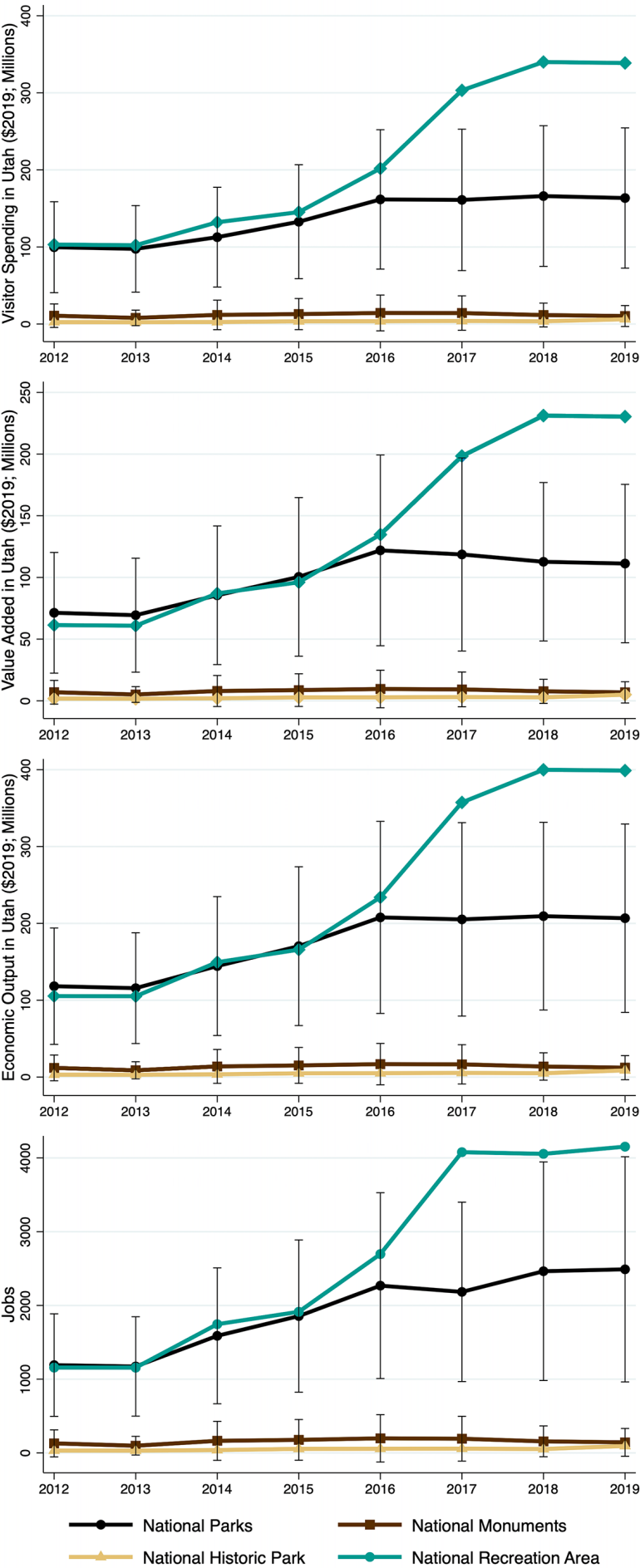
The five national monuments within Utah make notable contributions to the state's economy, however they appear marginal relative to national parks and the Glen Canyon NRA. Collectively, the visitor spending on trips to national monuments added \$16.9 million dollars to the state's economy in 2019 (0.10% of Utah GDP). Among the national monuments, Timpanogos Cave added the most to the state's economy (\$5.2 million in 2019). It is followed by Rainbow Bridge (\$4.3 million), Natural Bridges (\$3.5 million), Dinosaur (\$3.1 million), and Hovenweep NM (\$828 thousand).

## The Economic Benefits of National Forests in Utah

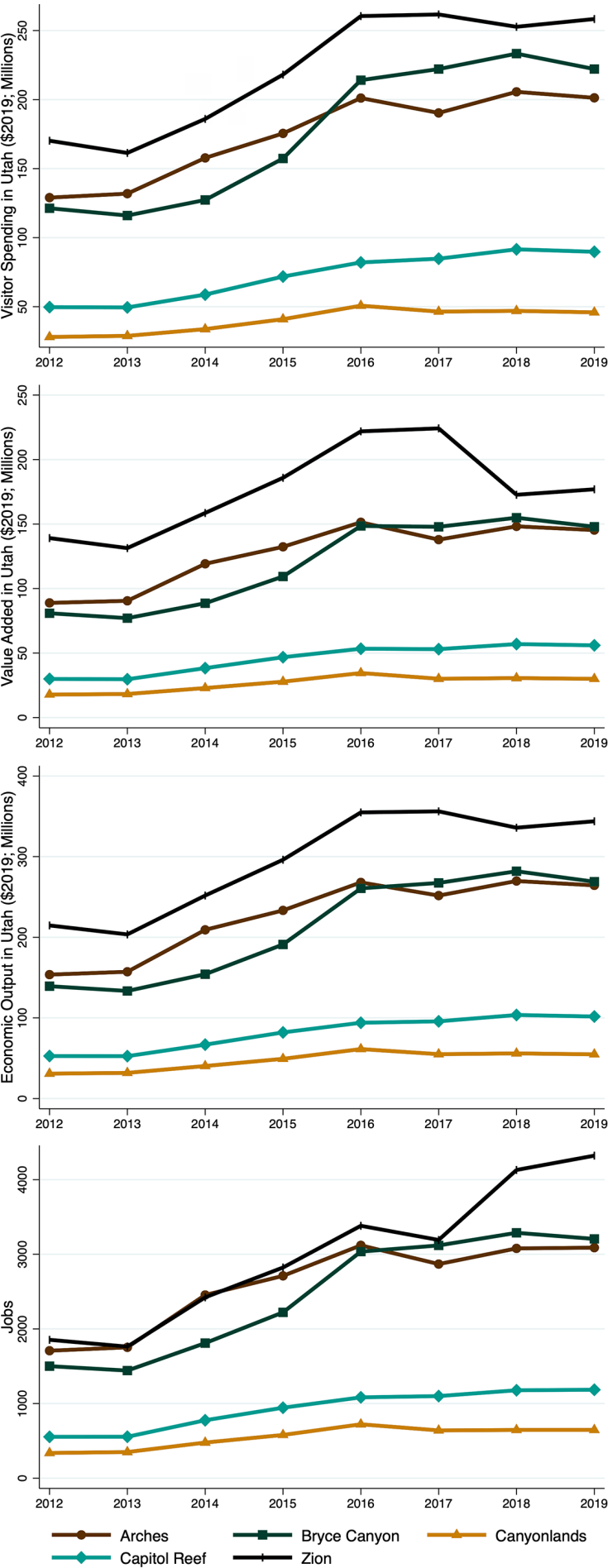
For National Park Service units, economic impacts (visitor spending, value added, economic output, jobs, labor income) are estimated through the use of on-site visitor surveys, the construction of visitor spending profiles, and input-output modeling. These same metrics for national forests are not currently available. However, we do have estimates of the welfare individuals gain by engaging in outdoor recreation on national forests. These economic values are monetary measures of the benefits received by participating in an outdoor recreation activity; they are also referred to as consumer surplus or net willingness to pay (i.e., total willingness to pay minus the cost of engaging in an activity) (Rosenberger et al., 2017).

The welfare generated by national forests in Utah follows visitation patterns. The Uinta-Wasatch-Cache National Forest generates the largest economic benefit of all the national forests within the state (Figure 13, [Table S4](#)). In 2017, the Uinta-Wasatch-Cache generated \$881 million in economic benefit; this value is increasing following the trend in increasing visitation for the forest (see above). The other national forests in Utah only generate a fraction of the economic benefit as the Uinta-Wasatch-Cache National Forest. In 2019, the Dixie NF generated \$78.4 million in economic benefit. The Ashley, Fishlake, and Manti-LaSal national forests generated between \$34.7 and \$56.3 million in economic benefit for the most recent year in which visitors were surveyed.

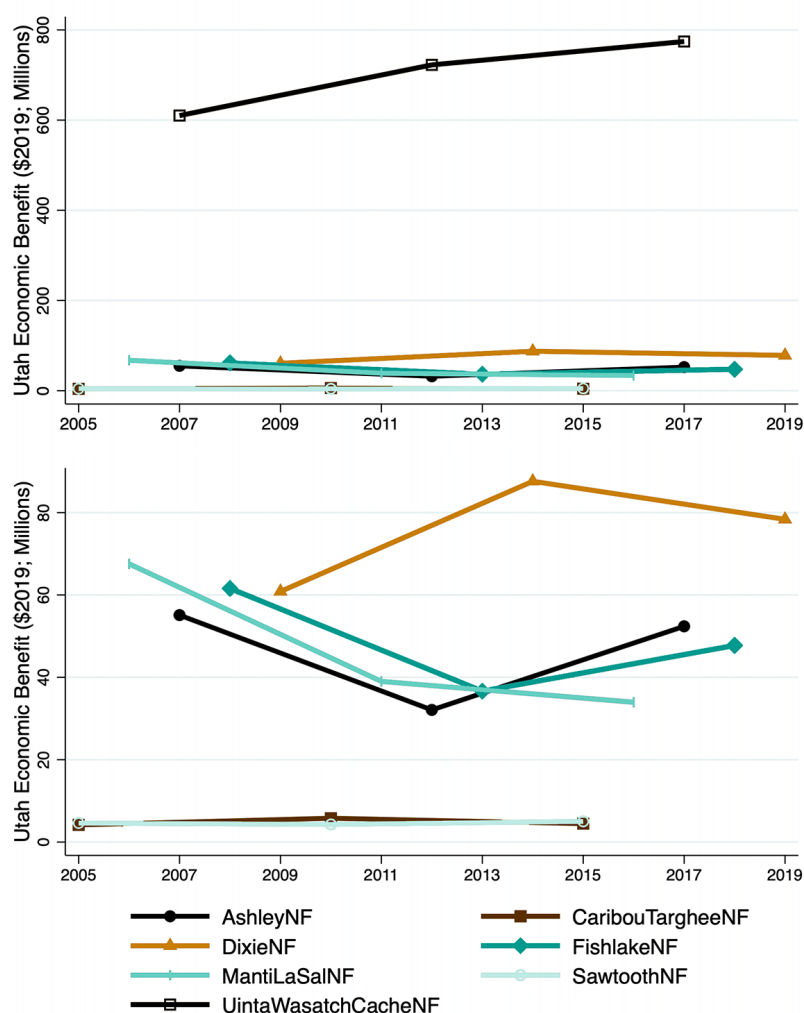
**Figure 12.** Economic impact of different types of National Park Service units within Utah. Vertical bars represent ranges of values when there is more than one unit (e.g., the maximum and minimum values for individual national parks). Data: National Park Service and Institute of Outdoor Recreation and Tourism at Utah State University.



**Figure 13.** Economic impact of national parks within Utah. Data: National Park Service and Institute of Outdoor Recreation and Tourism at Utah State University.



**Figure 14.** Economic value of national forests within Utah. Data: USDA Forest Service and Institute of Outdoor Recreation and Tourism at Utah State University.



## Operating Budgets and Revenues of Utah State Parks

Several key metrics of how well a state prioritizes outdoor recreation amongst other needs are: 1) their legislative appropriations to the state's park system; and 2) their state park systems' performance in meeting the demand for recreation and generating revenue within the constraints of their operating budget.

One-quarter of 1% of the state's annual budget is appropriated to the Utah Division of Parks and Recreation (Figure 15; Table S12). Relative to other states, particularly western states, Utah is making relatively large investments in the state's park system. The state ranks 7th amongst all states and 1st amongst western states in the proportion of a state budget appropriated to the state park system.

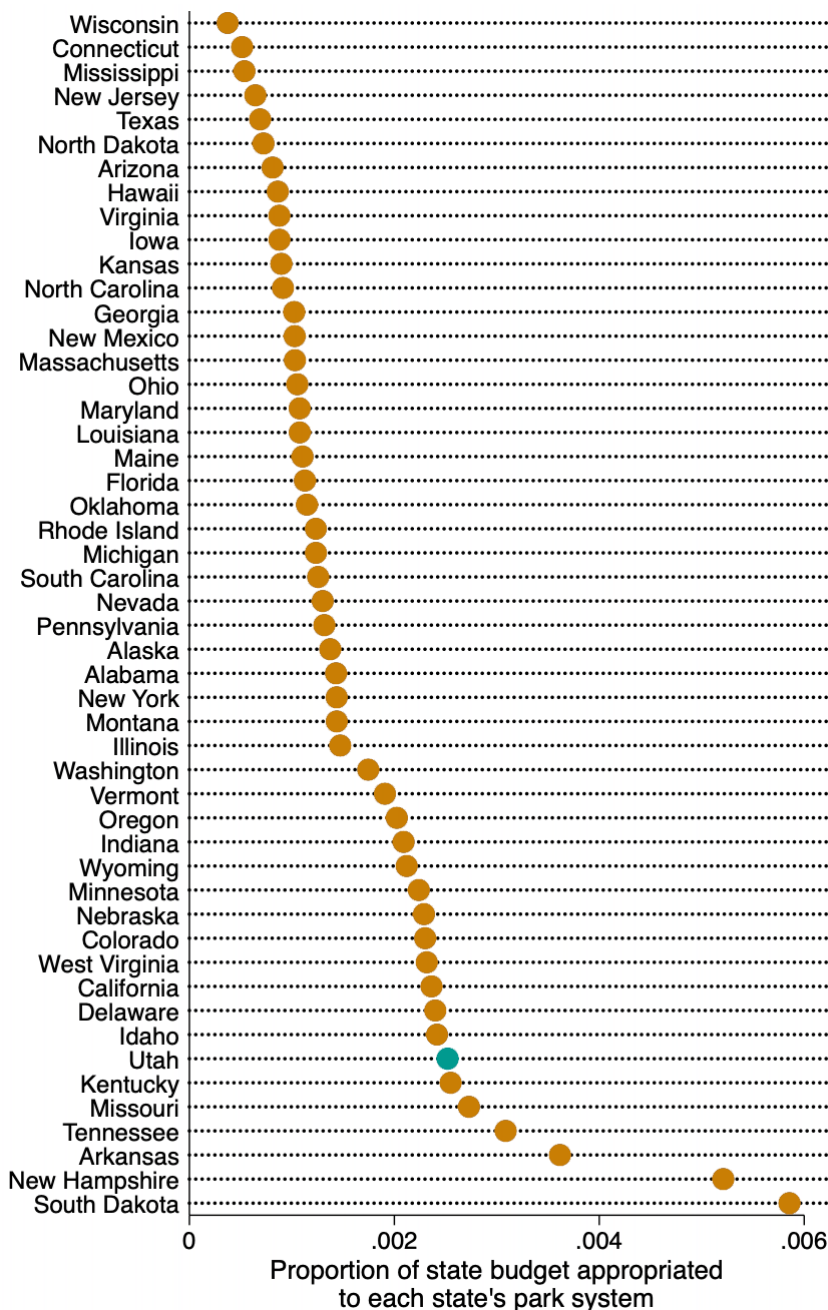
Utah's state park system is also effectively meeting the increasing demand for outdoor recreation, evidenced by the growing trend in inflation-adjusted revenues and the declining trend in inflation-adjusted operating expenditures (Figure 16; Table S13).

## Data and Research Needs

Data on the economic impact and benefits of outdoor recreation is very inconsistent across land management agencies and distinct types of outdoor recreation. The National Park Service estimates economic impact metrics for their units. These metrics, reported above, provide an understanding of the overall contribution of the value of national parks and monuments (as well as the state's National Park Service-managed national recreation area and national historic site) to the state's economy. However, similar metrics are not available for either national forests or Utah state parks.

Economic impact modeling of national forests is a relatively easy process, and can be undertaken with existing visitation data collected through on-site interviews. If the Forest Service or the state would like to know the economic value of outdoor recreation on national forests within Utah, this can be done using existing data and methods (White, 2017).





**Figure 15.** Legislative appropriations to Utah Division of Parks and Recreation relative to other states. Data: Institute of Outdoor Recreation and Tourism at Utah State University.

Of equal, or arguably more, value to the state would be an understanding of the economic value of outdoor recreation to Utah state parks. These metrics are not currently available, but could be used to leverage for more funding to support state park systems operations and infrastructure needs. The economic value of outdoor recreation at Utah's state parks is likely substantial, especially for state parks that provide motorized water-based activities.

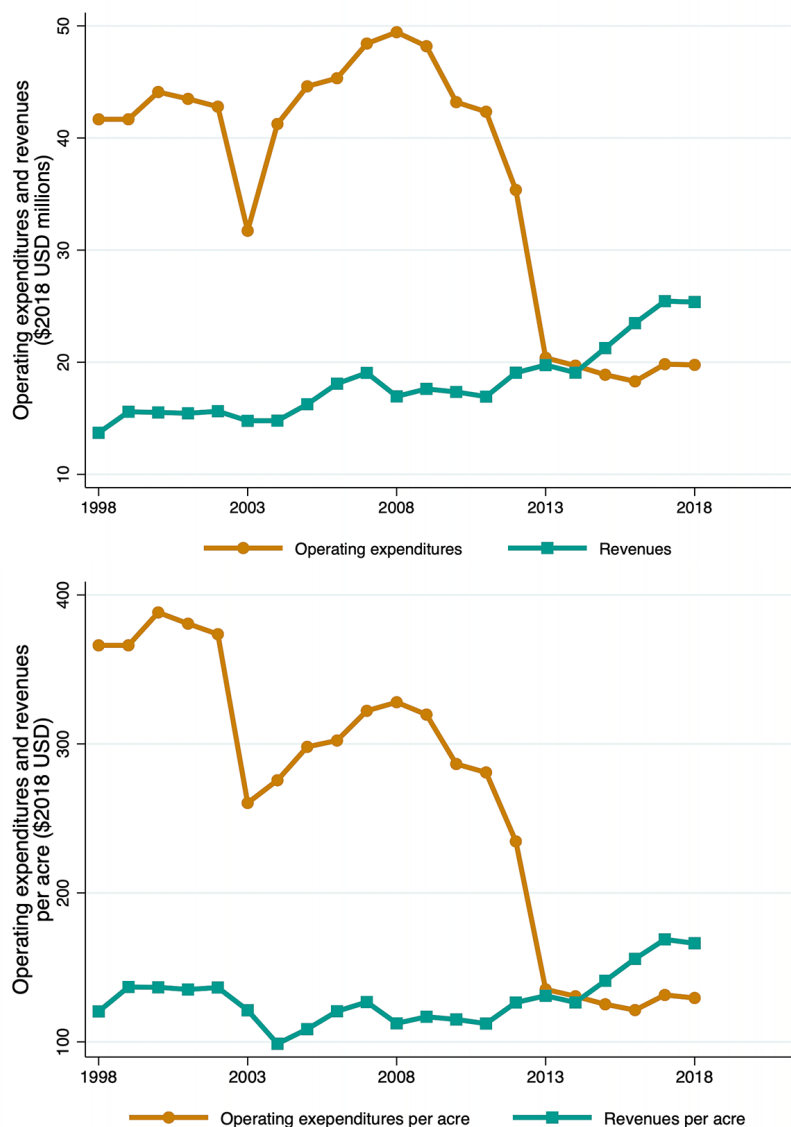
### Implications for Policy, Management, and Promotion

There has been considerable investment over the past decade into efforts focused on quantifying the economic benefits of outdoor recreation. These investments have come from the outdoor recreation industry

(e.g., the Outdoor Industry Association funded a study to estimate state-level effects of spending on outdoor recreation (2017)) and from federal agencies (e.g., the Bureau of Economic Analysis' outdoor recreation satellite account (2017)). These efforts, as well as agency-specific estimates such as those reported above, have made a good case for the importance of outdoor recreation to state economies. However, they are only a first step to understanding how states, as well as counties, cities, and towns, can maximize the value of outdoor recreation.

Economic benefits are not equally distributed across a state, and this is particularly true in states like Utah where many premier outdoor recreation destinations are located in relatively remote geographic locations.

**Figure 16.** Operating expenditures and revenues for Utah State Parks. Data: Institute of Outdoor Recreation and Tourism at Utah State University.



Remote destinations, and their small, gateway communities often receive very few of the economic benefits of being located near parks and public lands (Garrigós-Simón et al., 2015; Hjerpe & Kim, 2007). The majority of spending on outdoor recreation occurs where people live, and not where they recreate. This creates a disproportionate burden on Utah's small, gateway communities who host the urbanites who venture out on the weekends. State and local policies and promotion efforts related to visitor spending behavior (e.g., state-level efforts marketing remote outdoor recreation destinations, local sales tax rates, etc.) should focus on retaining economic benefits in cities and towns near destinations.

# INFRASTRUCTURE

Outdoor recreation depends upon the funding, construction, and maintenance of a massive amount of 'outdoor recreation infrastructure.' Infrastructure refers to man-made landscape features and physical structures created primarily to support participation in an outdoor recreation activity. Infrastructure can include everything from visitor centers to boat ramps to ski lifts. We only focus on trail infrastructure in this report given that: 1) trails are often considered one of the most universal types of infrastructure (i.e., they facilitate a wide variety of outdoor recreation activities); and 2) they are the only specific type of infrastructure for which a state-wide database is publicly available.

## Trails

As of early November of 2020, there were 26,775 miles (43,090 km) of trail in Utah. Utah State Parks manages the most concentrated trail networks, with 430 miles of trail across the state's 121 thousand acres of parkland (Figure 17, [Table S14](#)). The USDA Forest Service manages the most miles of trail within the state, 12,293 miles spread throughout 8.2 million acres of national forestland. The National Park Service and the Bureau of Land Management manage the least concentrated trail networks, with the National Park Service managing 1,229 miles of trail across 2 million acres and the Bureau of Land Management managing 9,523 miles of trail across nearly 23 million acres of public land.

Miles of trail per capita provides a useful way to view the geographic density of trails available to Utahns in the places where they live and spend most of their time (Figure 18, [Table S15](#)). This key metric shows trail availability is highest in the south central and south-eastern portions of the state. Garfield and San Juan Counties have the most miles of trail available to their

residents. Garfield County leads the state with just over 5,000 residents and more than 2,500 miles of trail (501.9 trail miles per 1,000 residents). San Juan County has the most miles of trail of any county within the state (4,277 trail miles; 15,308 residents; 279 trail miles per 1,000 residents). This metric illustrates the geographic differentiation between where the majority of the state's trails are and where the majority of the state's populations reside.

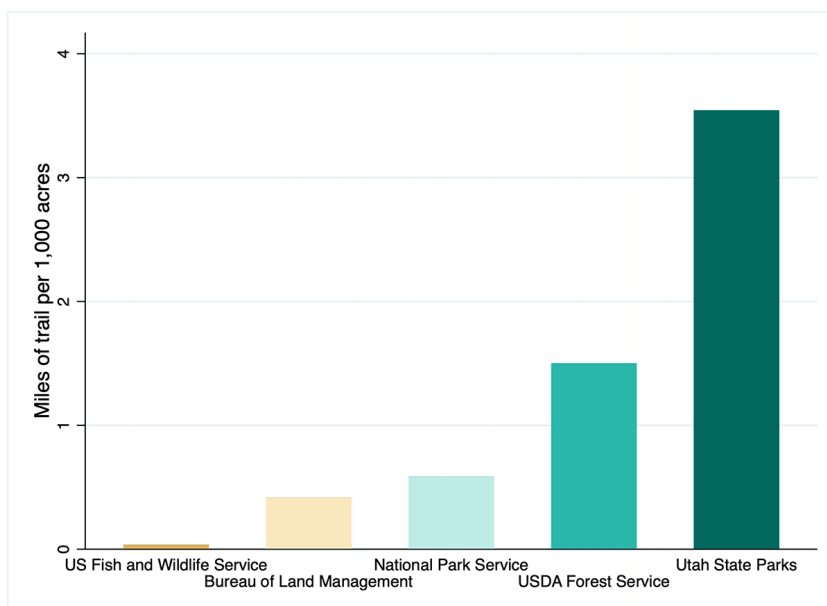
The amount of outdoor recreation infrastructure per capita, or per visitor, can also be used as an indicator of the safety of outdoor recreation destinations. For example, research in Arches National Park has examined the extent to which existing recreation infrastructure, which was designed to concentrate visitors, provides opportunities for social distancing within the park (see Insight Box 3).

## Data and Research Needs

Outdoor recreation management agencies and the state could benefit from the development of an outdoor recreation infrastructure database that includes a wide variety of infrastructure (e.g., boat ramps, corrals, pavilions, etc.) beyond trails. To be a useful monitoring and management tool, this database should cross administrative boundaries and be managed by the state. The state's trails database, managed by the Utah Automated Geographic Reference Center, can serve as an effective model in the development of this database.

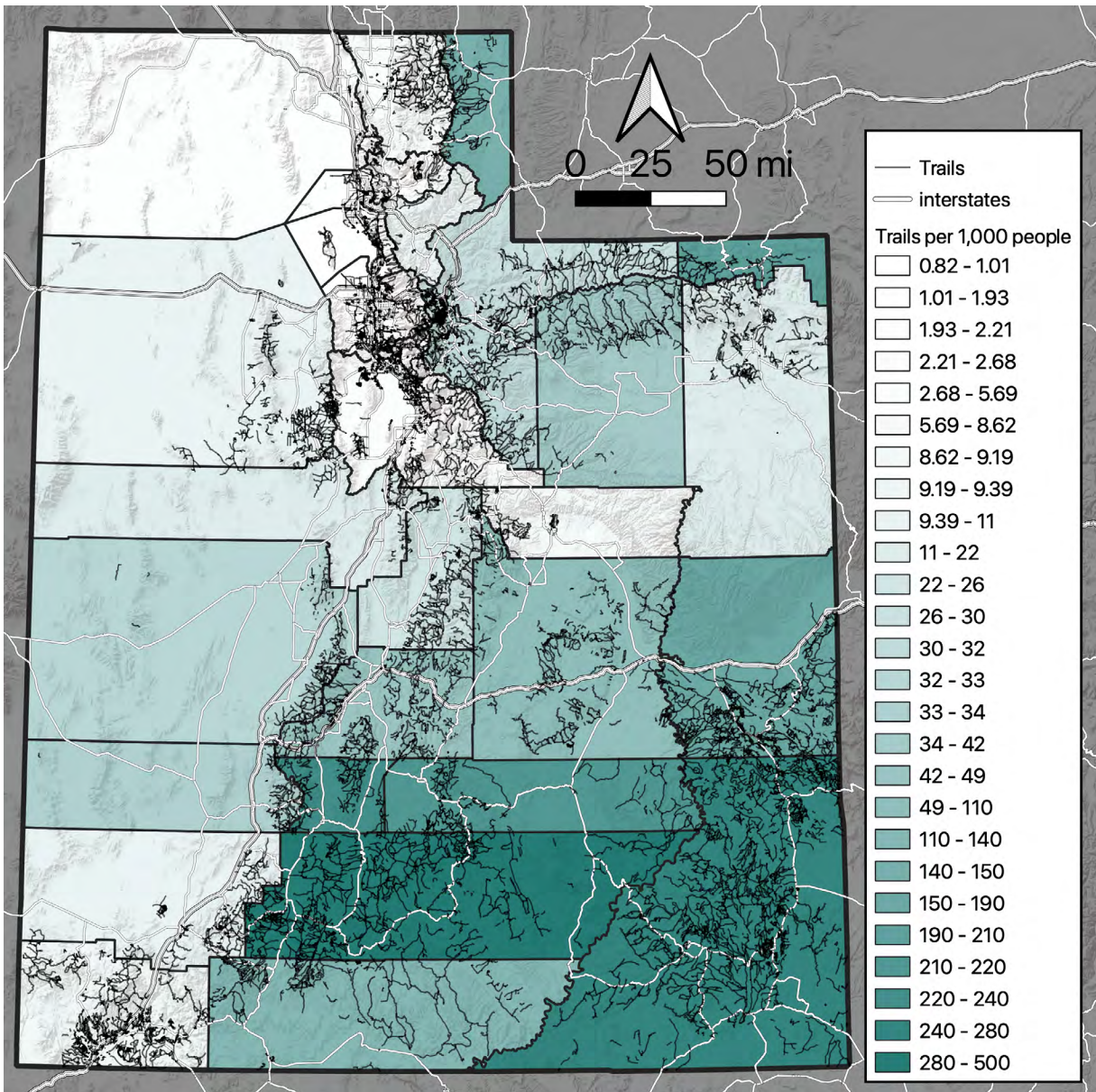
## Implications for Policy, Management, and Promotion

Investments in trail infrastructure are needed in the state's more populous counties. The populations of these urban counties are growing faster than more rural counties, resulting in an increased demand for locally-accessible outdoor recreation opportunities. The state's current infrastructure development and maintenance grant programs can be leveraged to meet this need. These grants include the Utah Outdoor Recreation Grant, the Utah Recreation Restoration Infrastructure Grant (administered through the Utah Office of Outdoor Recreation), as well as the Recreation Trails Program Grant (administered through the Utah Division of Parks and Recreation).



**Figure 17.** Miles of trail per 1,000 acres, by agency. Data: Utah Automated Geographic Reference Center.





**Figure 18.** Miles of trail per 1,000 people, by county. Data: Utah Automated Geographic Reference Center.



## Social Distancing Behavior and Visitor Encounters at Arches National Park

On March 27, 2020, the governor of Utah initiated a Stay Safe, Stay Home rule for the state of Utah that enabled county health departments to place restrictions on camping to non-county residents, overnight lodging, in-restaurant dining, and other essential services. These precautions, along with concern for the health of park staff, led to a closing of Arches National Park for a portion of March, April, and most of May of 2020. By the time Arches reopened on May 29th, demand was high enough that park managers moved into a phased entry approach in which visitors had to wait for up to three hours for admission. During the three days of May that the park was open, nearly 14,000 recreational visits occurred (National Park Service, 2020c). During the month of June, the park had returned to use levels of over 163,000 visits, and by July it recorded approximately 194,000 visits which is comparable to the July 2019 figure of 208,993 visits. Due to the design of national and state parks, most of this visitation is funneled into a relatively small portion of the park with an infrastructure designed to concentrate ecological impacts. The ability for outdoor recreation settings, such as Arches, to provide safe opportunities to escape in-house quarantine was unknown. We sought to answer the question: Is it possible to socially distance in a busy national park that has been designed to concentrate use?

We conducted an observational study in July 2020 at the outside foyer of the park's Visitor Center (Figure I3). Motion sensor cameras were placed to record one-minute videos when a person entered the field of view.



Figure I4. Motion sensor camera outside Arches National Park visitor center.

Number of groups, group size, facial coverings, and encounters within 6 feet of other groups were recorded. Groups were smaller on average than recorded in previous studies. Approximately 61% of the visitors wore masks. Most groups (69%) were able to experience the visitor center with no intergroup encounters. We model the probability of intergroup encounters and find as group size and number of groups increase, the probability of encounters rises. With four groups present, the probability of one or more encounters ranges from 19% to 40% for common group sizes, while if eight groups are present, the probability of one or more encounters increases from 34% to 64% for common group sizes (Figure I4).

Outdoor recreation appears to provide safe opportunities for escaping in-home quarantine during the COVID-19 pandemic. When given the physical space, visitors to places like our national parks appear to be taking precautions to avoid other visitors. Visitors also appear to be minimizing group sizes and wearing masks, and largely remaining socially distant. However, encounters increase as the number or the size of the groups increases. These results may not generalize to other outdoor recreation areas, such as narrow hiking corridors where the ability to move away from other people is limited. We recommend that park managers continue to appeal for compliance with CDC guidelines, especially the wearing of masks and encouraging visitors to split up into small groups when visiting.

**Wayne Freimund**, Professor, Utah State University-Moab ([wayne.freimund@usu.edu](mailto:wayne.freimund@usu.edu))

**Zach Miller**, Assistant Professor, Utah State University

**Madison Vega**, Undergraduate Student, Utah State University

**Doug Dalenberg**, Professor, University of Montana

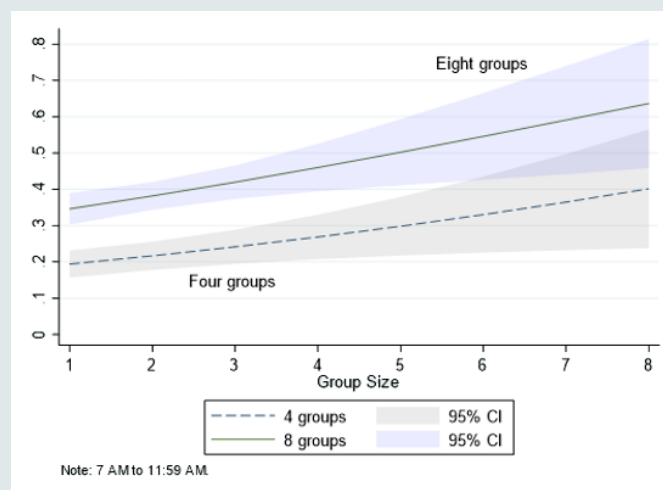


Figure I4. Probability of an encounter over group size and the number of groups present.

## GATEWAY AND NATURAL AMENITY REGION (GNAR) COMMUNITIES

Utah's wealth of outdoor recreation opportunities are supported by hundreds of small towns and cities located near national parks and forests. Whether a visitor is staying overnight in a bed and breakfast or just stopping for gas, these communities provide the goods and services that make outdoor recreation possible. These cities and towns are classified as gateway and natural amenity region (GNAR) communities (Rumore et al., 2019; Stoker et al., 2020). GNAR communities face a distinct set of challenges relative to other rural cities and towns: housing affordability, averages wages relative to cost of living, and a lack of resources and revenues, amongst others. State, regional, and local policy and promotion can alleviate some of the burden faced by Utah's small gateway communities as they host visitors from all over the world. Here we highlight several key metrics for how Utah's GNAR communities are different from non-GNAR cities and towns, and suggest some practical guidance for policy and promotion. This guidance stems from the collaborative research and capacity building efforts of the GNAR Initiative within the Institute of Outdoor Recreation and Tourism at Utah State University (see Insight Box 4).

### Utah's GNAR Communities

Utah has 192 cities and towns that can be classified as GNAR communities following the standard process of GNAR community identification (Stoker et al., 2020) (Figure 19). Criteria for inclusion includes having a population between 150 and 25,000 people, being located within 10 miles of a national park, monument, or forest, and being further than 15 miles from an urban area (see Stoker et al., 2020 for detailed criteria). These cities and towns are primarily spread throughout the Wasatch and Uinta mountain ranges; they also occur near parks and public lands in the extreme southwestern and southeastern portions of the state (Figure 19).

### How GNAR Communities are Unique

GNAR communities are significantly different from other communities in several key metrics ([Table S16](#)). First, they have a significantly smaller proportion of their populations employed in the labor force relative to non-GNAR communities (57% and 62% respectively). This can be largely attributable to the fact GNAR

communities have become premiere retirement destinations for hundreds of thousands of retirees over the past several decades (Hunter et al., 2005; Shumway & Otterstrom, 2001). As more retirees move to GNAR communities, they bring with them nest eggs, which often come in the form of cash savings and investment income. The large proportion of non-labor income in GNAR communities can be a good thing for local governments, as it provides some insulation against local economic volatility from particularly poor weather years (e.g., winters with little snow in ski towns or rainy summers in desert destinations). However, an increase in non-labor income can also cause problems. The increasing demand retirees place on housing and property markets cause real estate costs to increase, often leaving the local labor force priced out of the market. Locals increasingly find themselves in the position of commuting to jobs in GNAR communities from more rural and affordable locations. This can be especially burdensome for many employees in GNAR communities, given public transportation options are significantly less likely to be available and used (Figure 20).

The industrial profiles of GNAR communities also differ significantly from non-GNAR communities (Figure 20). GNAR communities have significantly smaller proportions of the population employed in professional, scientific, management, and administrative industries as well as the finance, insurance, real estate, and rental/leasing industries when compared to non-GNAR communities. There is an opportunity to spur economic diversification and resilience in GNAR communities through policies that incentivize investment from these underrepresented industries. Salaries and wages in these industries (professional, scientific, management, and administrative services as well as the finance, insurance, real estate, and rental/leasing industries) are significantly more than the accommodation, hospitality, and tourism industries which are synonymous with GNAR communities (Figures 21 and 22, [Table S17](#)). Policies that incentivize investment from underrepresented industries can help bolster average incomes, which significantly lag behind. Median household incomes in Utah's GNAR communities is nearly \$12,000 less than that of non-GNAR communities within the state (Figure 23).

### The GNAR Initiative

In order to help address growing challenges in Gateway and Natural Amenity Region (GNAR) communities, the Institute of Outdoor Recreation and Tourism recently partnered with the University of Utah to launch the GNAR Initiative, a hub for researchers, practitioners and community members to work together to understand and address the unique challenges of GNAR communities (Figure 15).

The Initiative was first conceived of by University of Utah professor Danya Rumore, who recognized a lack of scholarly research on gateway communities and saw a need for a place where communities could work together to share ideas and resources, and collaborate on challenges they face. Seeing this as an opportunity for USU Extension, Jake Powell, Extension specialist in the Department of Landscape Architecture and Environmental Planning and Jordan Smith, Director of the Institute of Outdoor Recreation and Tourism, worked with Rumore to couple the idea of the GNAR Initiative to Extension's mission of "improving the lives of individuals, families and communities."

Rumore, Smith, and Powell then set out to organize a steering committee of partner organizations to help guide and inform the Initiative. The current steering committee is composed of members from both state and federal organizations, such as the Utah Community Development Office, the Utah Office of Tourism, the National Park Services' Rivers Trails and Conservation Assistance program, and others. The Initiative is also actively creating a broader "partner" network with organizations across the west to collaborate on research and tools to help address GNAR community challenges.

At the onset of the COVID-19 pandemic, gateway communities were bombarded with both economic and social challenges. Given the immediate need, the GNAR Initiative was launched in order to help communities coordinate their responses and provide supporting resources. Over the last six months, the GNAR Initiative has hosted over a dozen educational webinars and peer-to-peer learning sessions, including a five-part series focused specifically on amenity migration and the potential influx of remote workers to GNAR communities. These webinars have been attended by hundreds of GNAR community members not only from Utah, but across the country and internationally. The Initiative has also developed a growing online toolkit, a compendium of resources that communities can use including peer-reviewed journal articles, online resources, or policy examples from GNAR communities across the west.

The GNAR Initiative team is continuing to grow its online toolkit, pursue relevant research, and provide a place where communities can connect. Still a young program, the resources available to community members will continue to grow as more research is completed and gathered.

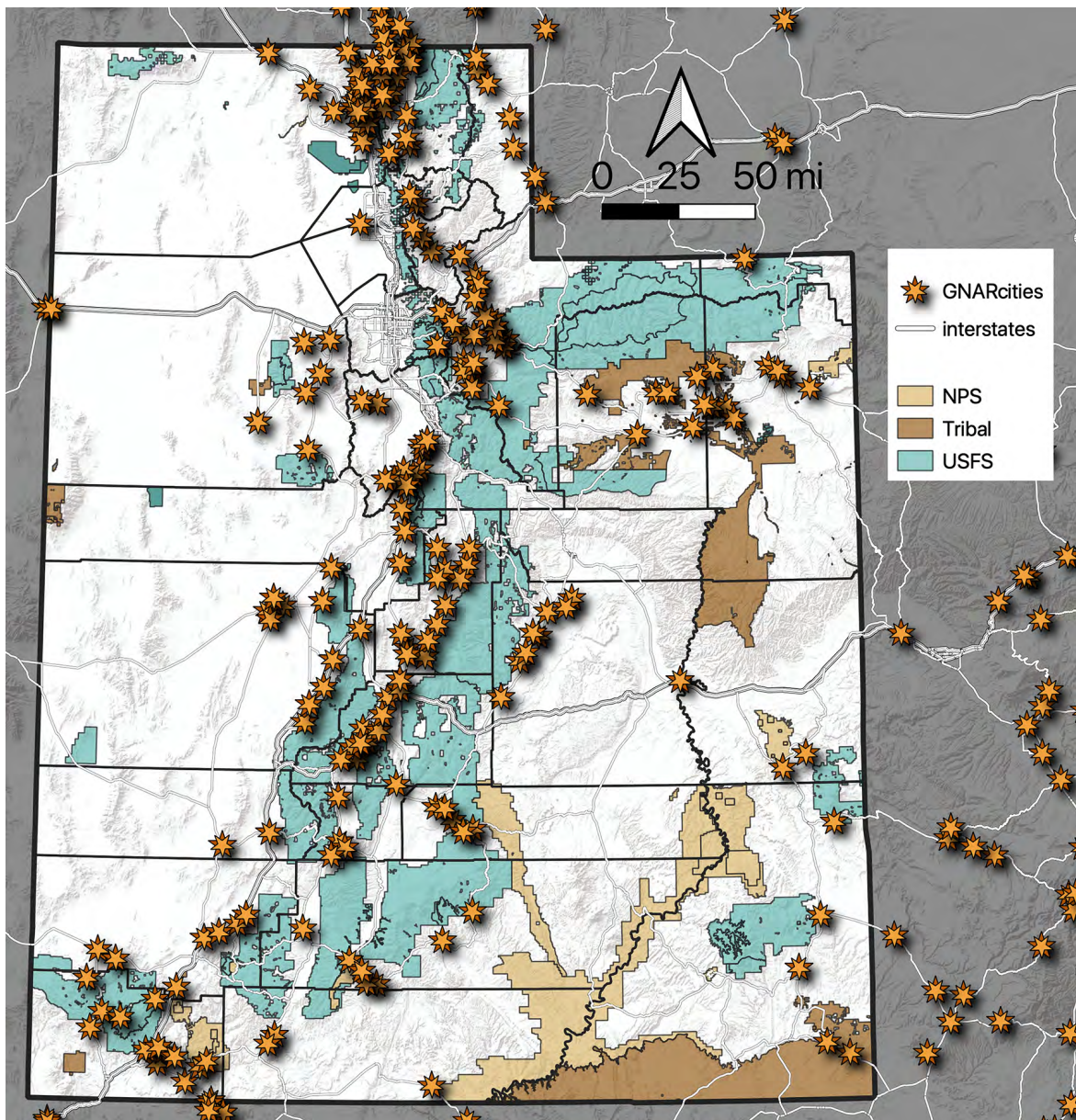
**Liz Sodja**, GNAR Coordinator, Institute of Outdoor Recreation and Tourism, Utah State University ([liz.sodja@usu.edu](mailto:liz.sodja@usu.edu))



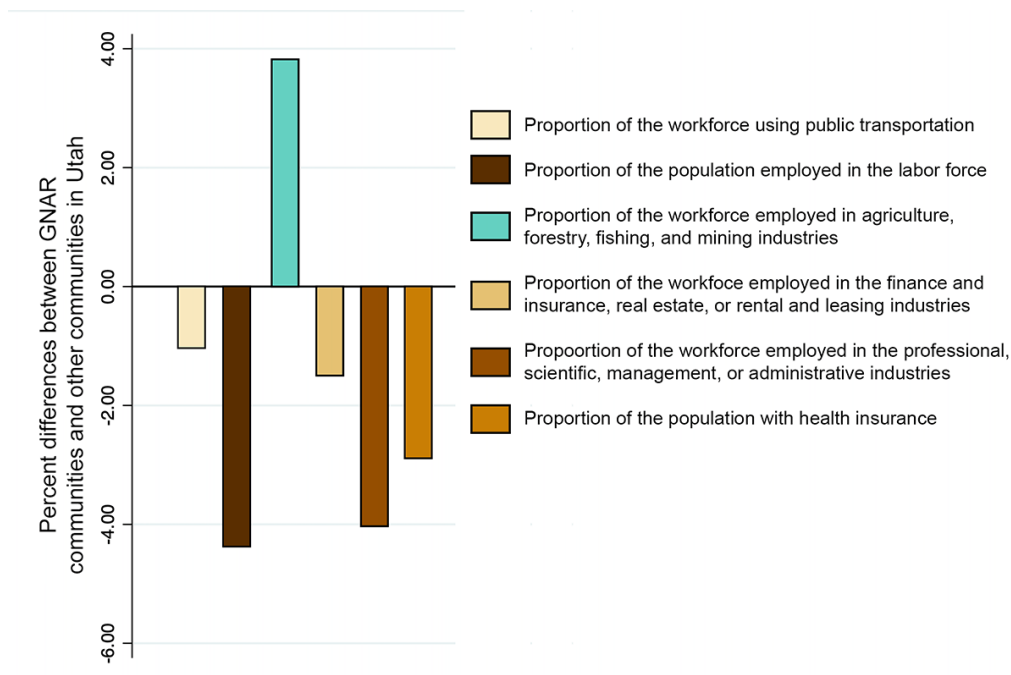
## GATEWAY AND NATURAL AMENITY REGION INITIATIVE

**Figure 15.** The GNAR Initiative is a hub for researchers, practitioners and community members to work together to understand and address the unique challenges of GNAR communities.

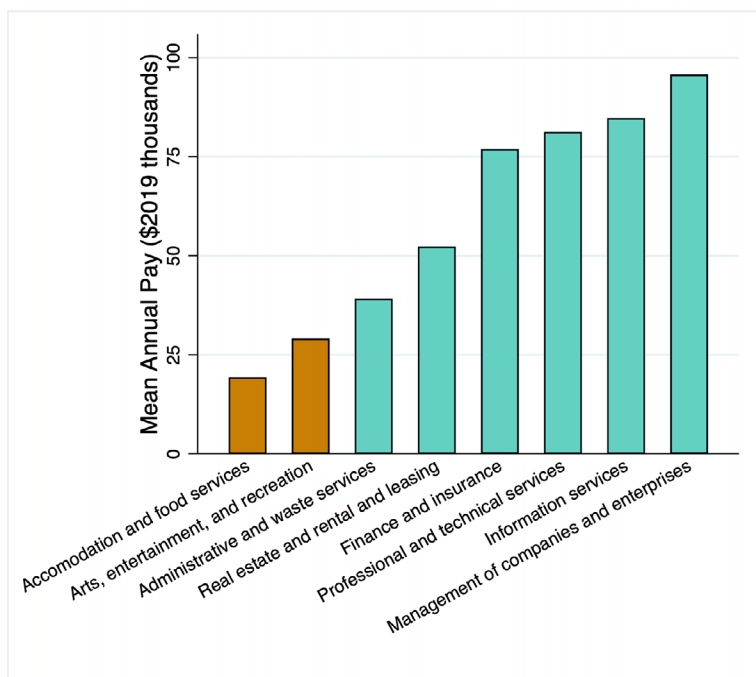




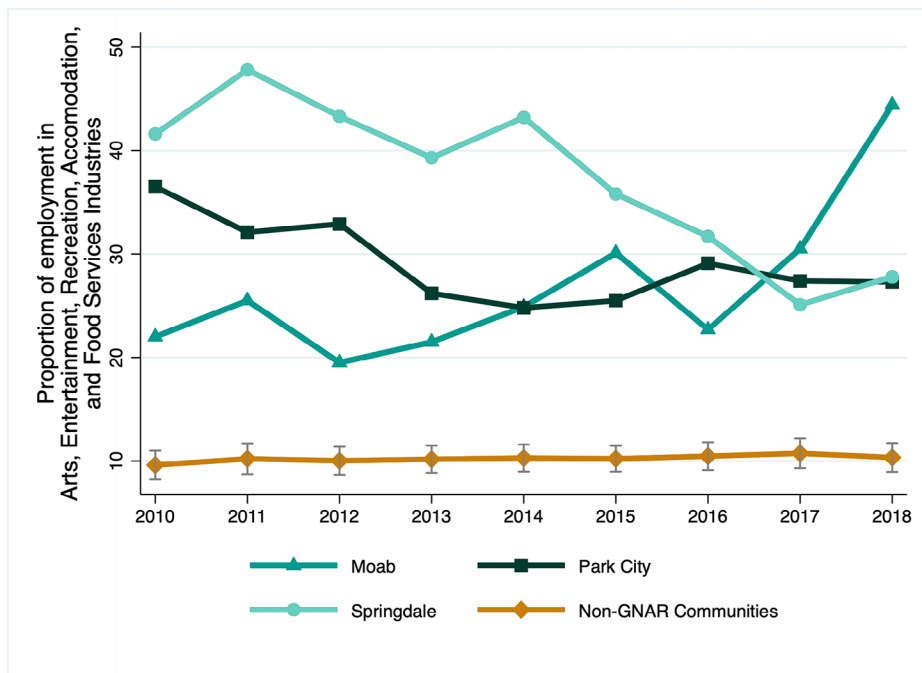
**Figure 19.** Utah's 192 gateway and natural amenity region (GNAR) communities. Data: Institute of Outdoor Recreation and Tourism at Utah State University.



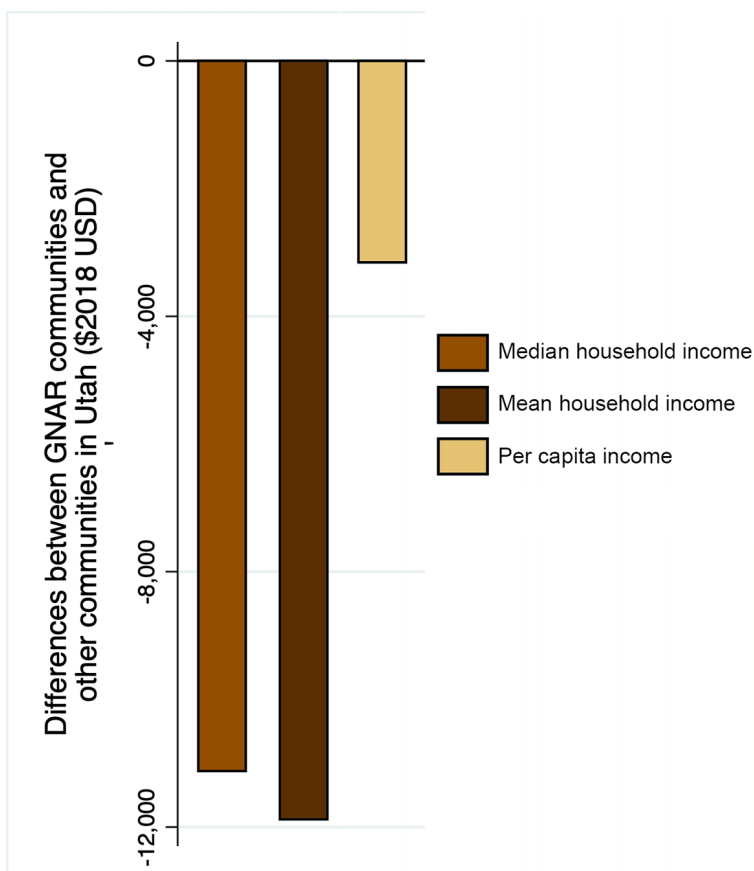
**Figure 20.** Significant differences between Utah's 192 gateway and natural amenity region (GNAR) communities and non-GNAR communities within the state. Data: American Community Survey, US Census Bureau and Institute of Outdoor Recreation and Tourism at Utah State University.



**Figure 21.** Mean annual pay across accommodation, food services, arts, entertainment, and recreation industries (brown) and professional and technical services industries (green). Data: US Bureau of Labor Statistics.



**Figure 22.** Trends in proportion of the labor force employed in the arts, entertainment, recreation, accommodation, and food services industries in several notable Utah GNAR communities and all non-GNAR communities within the state. Data: American Community Survey.



**Figure 23.** Significant differences in income between Utah's 192 gateway and natural amenity region (GNAR) communities and non-GNAR communities within the state. Data: American Community Survey, US Census Bureau and Institute of Outdoor Recreation and Tourism at Utah State University.



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OUTDOOR  
RECREATION  
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UTAH STATE UNIVERSITY