



Establishing a pre-COVID-19 baseline for surf tourism: Trip expenditure and attitudes, behaviors and willingness to pay for sustainability



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ABSTRACT

This manuscript provides the only empirically derived pre-COVID-19 global estimation of international surf travel spending and the first assessment of sustainable surf tourism attitudes, behaviors, and willingness to pay. It establishes important baselines that can serve as points of comparison as, and after, surf tourism returns, inevitably changed, post-COVID-19. Employing a direct cost method, international surf tourism expenditure was valued between \$31.5 to \$64.9 billion USD per year and surfers reported being willing to pay between \$1.99 and \$4.1 billion USD more annually for sustainable surf tourism products. These results suggest surfing tourism deserves a more significant place in funding initiatives, discussions, and research related to fostering sustainable development from ocean resources in the rapidly changing world.

1. Introduction

Oceans are the home of an under-recognized and under-appreciated “blue economy.” At a time when the world is looking for sources of growth, there is huge potential for “blue growth”—wisely preserving and investing in the value of ocean ecosystems to fight poverty and improve lives. (Zoellick, 2012 quoted in Silver, Gray, Campbell, Fairbanks, & Gruby, 2015, p. 142)

The COVID-19 pandemic has brought international tourism to a virtual halt and resulted in calls for tourism to qualitatively shift to more sustainable trajectories (Benjamin, Dillette, & Alderman, 2020; Gössling, Scott, & Hall, 2020; Higgins-Desbiolles, 2020). Post-COVID-19 tourism recovery is likely to be led by younger, more adventurous, crisis resistant tourists (Hajibaba, Gretzel, Leisch, & Dolnicar, 2020; Peters, Peters, & Peters, 2020) travelling to sparsely populated, remote destinations that offer built in social distancing (Hall et al., 2020). Surf tourism offers a large pool of the appropriate tourism demographic and psychographic profile, as well as, many thousands of suitable destinations. As such, a logical response of surf tourism researchers is to seek to understand how the COVID-19 pandemic will impact surf tourism in the short, medium and long terms.

Adequate baselines are needed, however, to effectively assess change. No reliable baseline studies of pre-COVID-19 international surf tourism spending and sustainable tourism attitudes and demand exist. Most surf tourism research has failed to offer a global value, or has cited the speculative figure that the entire global surf industry is worth between USD \$70 and \$130 billion annually and that surf tourism is the largest and fastest growing subset (O'Brien and Eddie, 2013). As the window for real-time pre-COVID-19 data collection has closed, the authors of this study seek to utilize data from a large scale, wide ranging survey of surfers conducted in 2015 to meet this need. Data from this survey have informed studies exploring a diverse range of topics from surf park preferences (Ponting, 2017) to the use of surf forecasting technology and its impact on destinations (Mach, Ponting, Brown, & Savage, 2018), but have not previously been applied to establishing baselines of this kind. As surf tourism recovers and pivots to accommodate market changes, this baseline will be vital to recognizing and responding to change. As such, the first aim of this paper is to provide an empirically derived global estimation for how much surfers spent annually on international surf tourism before the COVID-19 pandemic.

The lack of any global surf tourism expenditure estimate has also resulted in its absence from important global discussions around the “blue economy.” ‘Life below water’ is one of seventeen United Nations Sustainable Development Goals and calls for the conservation and sustainable

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use of marine resources to benefit coastal communities. Tourism has been critical in this effort, particularly in small island developing states and in low-and-middle-income countries. In this vein, the “blue economy” paradigm acknowledges that in order to grow economies and facilitate human flourishing, a balance must be established between the derivation of economic value from oceans on the one hand, and protecting sensitive ecosystems on the other (Bennett, Cisneros-Montemayor, Blythe, et al., 2019; Phelan, Ruhanen, & Mair, 2020; Silver et al., 2015).

In 2017, coastal and marine tourism accounted for roughly 26% of the entire ocean-based resource economy, which included commercial fisheries, as well as, oil and gas extraction, making it the fastest growing value-added segment at the time (Brumbaugh, 2017). A widely cited pre-COVID-19 estimate suggested that coral reefs were generating \$36 billion a year in economic value from tourism – \$19 billion was attributed to direct ‘on reef’ activities like diving, snorkeling, and wildlife boat tours and \$16 billion to “reef adjacent” tourism, which includes activities “afforded by the sheltering effect of adjacent reefs” (Spalding et al., 2017; Brumbaugh, 2017). While paddle boarding was briefly acknowledged as a reef-adjacent activity, surfing was not mentioned at all, despite the reality that coral reefs provide the bathymetric foundation for many heavily patronized surf tourism destinations (Dolnicar & Fluker, 2003; McGregor & Wills, 2016)

The persistent omission of surfing’s contribution to the blue economy warrants attention and perhaps even more so presently because surfers will be some of the first tourists to fan out to remote coastal communities once COVID-19 travel restrictions are lifted. Perhaps even with a gold rush-like fervor to reach certain coveted surf destinations before the crowds return. Surf media outlets maintain the enthusiasm of surfers to get traveling again, one going so far as to say, “even a zombie apocalypse would not stop surfers traveling for waves” (Peirson, 2020). Hyperbole aside, Hajibaba et al., (2015) identified the characteristics of external crisis-resistant tourists and found that, like many surf tourists (Dolnicar & Fluker, 2003; Porter & Usher, 2019; Sotomayor & Barbieri, 2016), they are generally younger, utilize social media for travel information, engage in more adventurous activities and sports, are interested in health, and are less concerned with prices.

Surfers prioritize uncrowded quality surfing waves much more highly than social elements like the presence of bars and other gathering places (Dolnicar & Fluker, 2003; Porter & Usher, 2019; Sotomayor & Barbieri, 2016). Adding fuel to pent up surf tourism demand, because travel is synonymous with the surfer habitus (Anderson, 2014; Ford & Brown, 2006; Krause, 2012), the surf media and surf forecasting sites (and their related social media platforms) have continued to broadcast images of perfect waves around the world that are empty as a result of the pandemic and its restrictions. National governments have also been complicit in this effort, demonstrating their understanding of surf tourism value. The Indonesian government, despite closing the country to tourism at the time of this publication, is allowing pro-surfers to purchase special visas to enter the country and film surf sessions at unprecedentedly uncrowded locations, which functions as a way to stoke the desire for future visitation and earn tourism revenue during the lockdown (Rielly, 2020). France as well, has banned surfing, but allowed professional surfers a special exemption to surf, film, and share photographs and videos of uncrowded waves (The Inertia, 2020). This transmits imagery of the symbolic elements of imagined surfing nirvanas that have compelled surfers to travel since the surf media’s inception in the 1960s (Ponting, 2009). Cognizant of these factors, countries like Costa Rica, where 16% of all tourists visiting are primarily motivated by surf travel (Blanco, 2013), are appealing to would be post-COVID-19 surf travelers by highlighting low transmission and death rates, quality healthcare, and boutique destinations with built in isolation and social distancing on remote beaches (Rico, 2020).

While surfers want to get traveling and some governments and business owners want to lure them, it is important to note, that even prior to the pandemic, sustainability challenges in surf tourism have been well documented, particularly in low-and-middle-income countries. Surfing has been credited with challenging damaging gender and cultural stereotypes

and enhancing income opportunities for destination residents (Britton, 2015; Comer, 2010; Mach, 2019), and conversely positioned as a largely negative neo-colonial force arriving uninvited to previously unvisited areas and installing systems propelled by foreign ownership and free market principles (Ponting, McDonald, & Wearing, 2005; Ruttenberg & Brosius, 2017). On balance, the economic benefits of surf tourism (which have bypassed communities in some destinations), come with a suite of costs that incur in varying degrees in different contexts around the world. These include ecological issues related to coral reef damage, untreated effluent in waterways, unscrupulous coastal development, and, social issues including gentrification, loss of cultural values, drug and alcohol abuse, and prostitution (Krause, 2012; West, 2014).

Understanding this dual positionality, researchers have postulated approaches for managing surf tourism to achieve sustainable outcomes, and many studies have argued that sustainable surf tourism ought to be the paradigm driving the industry (Borne & Ponting, 2017; Buckley, 2002; Mach & Ponting, 2018). Despite this, to date, no studies have quantitatively assessed demand for the kinds of sustainable products and tourism offerings normatively proffered by researchers. As such, the second aim of this paper is to establish a baseline understanding of surfer’s attitudes, beliefs, and willingness to pay for sustainable tourism. We believe this is a timely study given the role that sustainable forms of surf tourism are likely to play in post-COVID-19 tourism recovery for many destinations. Our goal is that the information presented in this manuscript provides a useful baseline for assessing change over time and can help steer policy and entrepreneurial practices in the direction of sustainable outcomes for communities engaging in efforts to derive local benefits from surf resources as tourism begins to recover.

2. Literature review

2.1. Demand for sustainable tourism

Tourist demand for sustainable products is far too often overlooked, or taken as static, rather than something that can change or shift (Font & McCabe, 2017; Sharpley, 2014). Tourism sustainability, however, cannot be achieved solely from the supply-side and demonstrating demand for sustainable products and destinations can incentivize investments in this direction. Many scholars suggest, however, there is a critical difference between consumer values and desires for sustainable outcomes and their actual behaviors and that this word-deeds/actions-behaviors gap also exists in tourism (Hibbert, Dickinson, Gössling, & Curtin, 2013; Pulido-Fernández & López-Sánchez, 2016; Weaver, 2012). Mkono and Hughes (2020) and Moscardo and Hughes (2018) found that while tourists understand the negative impacts of tourism and claim to want to make environmentally friendly decisions, they are frustrated by a range of barriers and express particular irritation with being overwhelmed by the amount of options available, which renders it difficult to know which behaviors to choose. Indeed, research suggests that differences in sustainability knowledge between tourists impacts their willingness to pay for sustainable tourism products and/or levies and taxes for public investments in local sustainability (López-Sánchez & Pulido-Fernández, 2016; Pulido-Fernández & López-Sánchez, 2016).

Pulido-Fernández and López-Sánchez (2016) found that only about a quarter of visitors to Andalusia, Spain, were willing to pay more for vacations that promised to improve the sustainability of the area as a result of the additional expenditure. Most of those were willing to pay about 10% more. While some demographics concerned with a lifestyle of health and sustainability (LOHAS) may comprise market segments willing to pay for sustainable tourism products (López-Sánchez & Pulido-Fernández, 2016; Nickerson, Jorgenson, & Boley, 2016), macroeconomic analyses have not yet demonstrated a critical mass of tourists willing to pay more for sustainable features of tourism products (Weber, 2019). That said, tourists with lower environmental footprints tend to have higher individual expenditures, suggesting that targeting tourists seeking sustainable experiences make sense for destinations from both an economic and a socio-

environmental standpoint (Moeller, Dolnicar, & Leisch, 2011; Nickerson, Jorgenson, & Boley, 2016). As such, it is important to learn more about segments receptive to being steered towards sustainable tourism products at a premium (Dolnicar, Crouch, & Long, 2008; Font & McCabe, 2017), particularly in light of an expected turn toward sustainability in post-COVID-19 tourism (Benjamin, Dillette, & Alderman, 2020; Brouder, 2020; Gössling, Scott, & Hall, 2020). Researchers are yet to investigate if surf tourists (or segments within this broader market) are concerned about sustainability, or are willing to pay more for sustainable tourism products.

2.2. Surf tourism value and sustainability

Surf tourism may look quite different post pandemic. The current value of the surf tourism industry, particularly international surf tourism, has clearly been decimated in the short term and there is a need for research to explore these impacts. However, to date, there is no reasonable demand-side estimate of the value of pre-COVID-19 international surf tourism, though some surf-break specific work has been carried out. For example, two of the largest surf related environmental non-profit organizations (Save the Waves Coalition and the Surfrider Foundation) have been conducting and funding valuation studies of individual surf areas through the direct valuation method they call surfonomics. This method entails estimating the annual number of surf visitors to an area and multiplying this by survey results demonstrating their average length of stay and daily spending averages (for an example see Wright, Hodges, & Sadrpour, 2014). These studies have resulted in direct expenditure estimates suggesting surf tourism per annum is worth \$1.6-\$6.4 million USD in Pichilemu, Chile; \$4.2 million USD in Guarda do Embau, Brazil; \$1.7 million USD/year in Huanchaco, Peru; and \$35 million USD in Uluwatu, Indonesia (Save the Waves Coalition, 2020; Wright et al., 2014). These data have been leveraged to encourage the creation of World Surfing Reserves in these locations as part of an effort to protect surf-breaks from competing industrial, agricultural, and/or infrastructural projects that could harm surf resources. Other individual surf-resource values have been estimated using different methods, such as the non-market value, travel cost method (Lazarow et al., 2008), and hedonic price method (Scorse & Hodges, 2017; Scorse, Reynolds, & Sackett, 2015). The variety of methods used, the relatively small number of locations and their geographic dispersal does not enable empirical extrapolation towards a global value estimate.

Empirical work conducted to better understand surf tourism and surf tourists has focused on how surf attributes impact travel behaviors (Hritz and Franzidis, 2018), creating market segments (Dolnicar and Fluker, 2003), deciphering how life cycle impacts surf travel demands (Porter and Usher, 2018), and understating the connections between surf travel behaviors and serious leisure (Portugal, Campos, Martins, & Melo, 2017; Sotomayor & Barbieri, 2016). All converge around the notion that surfers are hyper-mobile, that the waves are the most important factor inspiring their travel, and the more serious a surfer is, the more they travel to surf. Porter and Usher (2018) for example found that 63% of surfers go on 1-3 surf vacations per year, 20% go on 4-7 and 17% go on eight or more. Dolnicar and Fluker's (2003) data suggests that 43% of surfers reported going on multiple surf vacations per year and that 25% said that they go on at least one per year. Almost all research on surf tourism has found that surfers, above all else, seek uncrowded waves of a quality comparable to their skill level.

Dolnicar and Fluker (2003) asked surfers the importance of various surf destination attributes (i.e., lack of crowds, safety, accommodation quality, and cost) and used these responses to create five market segments: luxury surfers, the price conscious adventurers, price-conscious safety seekers the ambivalent and the radical adventures. They argued, that the first two groups mentioned were the oldest, with the highest incomes and the most skill and, therefore, were willing to pay the most to travel, making them attractive market segments to target. Sotomayor and Barbieri (2016) also concluded that serious surfers represent a 'great opportunity for surf tourism because they travel more in their quest for the perfect wave and reported relatively high incomes,' but they were not able to determine

whether their travel expenditures differ greatly from casual surfers. In their research conducted on domestic surfers visiting Wilmington North Carolina, USA, Hritz and Franzidis (2018) found that individuals with more years surfing experience spent more than individuals with less experience. None of these studies, however, explored how important sustainability was to surfers' destination choice, or how much more they were willing to pay for sustainable tourism products.

Some scholarly manuscripts dedicated to surfers and environmentalism have postulated that surfers are innately environmental activists, while others critique this assumption, suggesting that surfers do not often walk the talk (Butt, 2015; Ford & Brown, 2006; Hill & Abbott, 2009). In one example, Butt (2015) posited that a predilection for surf travel may facilitate surfers having an average carbon footprint double that of the average citizen. Similarly, Reineman et al. (2017) found that surfers tacitly experience sea-level rise and demonstrate specialized knowledge and concern about climate change, however, the extent to which they are active in taking measures to prevent and mitigate it was unclear. Hill and Abbott (2009) found that while a small group of surfers from Florida overwhelmingly sought to portray themselves as environmentally progressive, only half considered themselves 'environmentalists' and even fewer reported seeking out environmentally friendly surf products. Bucking this trend, Frank et al., 2015 found that 86% of surf tourists visiting Algarve, Portugal were willing to pay an accommodation tax earmarked for environmental protection. We seek to discover if this trend extends beyond the Portuguese case study.

3. Methodology

A global online survey was conducted to ask surfers questions related to demographics, surf attributes, surf travel information, technology and surf forecast use, surf pool desirability, and sustainability attitudes and actions. Data was collected using Qualtrics online survey platform between May 1 and July 22, 2015. Online surveys facilitate rapid global reach, while providing data of similar quality to mail and telephone surveys (Gosling, Vazire, Srivastava, & John, 2004). The authors' contacts and social media platforms, surf clubs and associations, and surf-brands' social media platforms were utilized to collect responses from self-ascribed surfers over 18 years-old. Employing a snowball sampling technique, all participants were asked to share the survey link with other surfers. While the relevance of five-year-old data might ordinarily be brought into question, in order to move forward with surf tourism research during and after a paradigm shifting pandemic, a pre-shift baseline for comparison is crucial. The data utilized here are the most recent pre-COVID data capable of addressing the twin aims of this study.

This manuscript utilized select questions related to international surf travel behaviors and expenditures, as well as, sustainability attitudes, actions and willingness to pay. To approximate how much surfers spent on their international surf trips globally, we modelled the direct expenditure approach used in other surfonomics studies (Save the Waves Coalition, 2020; Scorse & Hodges, 2017; Wright et al., 2014). Estimates of the global surf population (Lazarow, Miller, & Blackwell, 2008; O'Brien & Eddie, 2013) and the frequency with which surfers travel abroad have been published (Dolnicar and Fluker, 2003) and the latter were deemed acceptable to use for calculations with our survey findings given similarities in surf ability proportions between samples. To complete macro-calculations, we pulled data on last international surf trip spending and duration. Both questions were intended to provide exploratory information on actual expenditures and required respondents to choose from pre-selected unequal interval choices and percentages were displayed as descriptive statistics. In estimating global values, mean values were approximated by taking the average dollar amount of the mean interval selection (i.e., if the mean interval was \$1,000 to 2,999 USD, the overall group mean for calculations was approximated as \$1,999.5 USD, or the average of that interval). This process was repeated for the average willingness to pay. To remain consistent with studies based on actual expenditures, the last trip was used as a proxy for surf travel expenditures per trip, rather than asking surfers to mentally compute their average expenditures during a long survey. This

approach is limited in that the value used is not necessarily each surfer's estimated average surf trip expenditure, but this only really impacts the segment that goes on multiple trips per year. We argue, in this case, this skews the value we propose in a conservative direction, as frequent surf travelers often take closer and relatively less expensive trips (i.e., surfers from California visiting the Baja Peninsula in Mexico or Spanish surfers traveling to Morocco), than long distance and high costs ones, which ought to lend greater validity to results.

To derive willingness to pay for sustainable tourism estimates, a direct measure approach was utilized to ask each respondent to determine the hypothetical willingness to pay more for a surf trip that was sustainable. Percentage responses for each interval were displayed and the average of the mean interval was calculated to derive the mean willingness to pay for sustainable tourism. Meta-analysis suggests that the value given in such direct measurement approaches tends to be inflated by 21% on average in relation to what someone is actually willing to pay (Schmidt and Bijmolt, 2020) and this correction was applied to derive our macro estimate.

To gain an understanding of sustainability's importance to surf travel decisions we added sustainability to a list of important surf tourism criteria found in other studies (Porter & Usher, 2019; Sotomayor & Barbieri, 2016) and conducted a Borda count (Black, 1976) to analyze the relative importance of each. In order to understand sustainable surf tourism attitudes and behaviors, questions were developed that drew from surf sustainability literature, which suggests sustainable surf tourism ought to bring economic, social, and environmental benefits to local communities and ecosystems (Borne & Ponting, 2017; Buckley, 2002; O'Brien & Ponting, 2013). Questions designed to approximate the relative importance of appearing as a "sustainable" surf traveler, and surf tourism providers' support for local communities and the environment were asked. Considering that surf tourism providers are the key interface between tourists and local communities/ecosystems (O'Brien & Ponting, 2018; Ponting, McDonald, & Wearing, 2005), behavioral questions focused on the importance of sustainability to the tourists' pre-trip research process as well as in actual tourism provider selection.

Likert responses were first collated to gain a broad understanding of our samples' responses. Because the researchers created these questions to organize them into different constructs (sustainable attitudes and sustainable behaviors), Cronbach's alphas were calculated to analyze the internal consistency within groups and alphas between .75 and .95 were required to justify running statistical tests on the group averages (Tavakol and Dennick, 2011). Spearman-Brown correlation analysis was conducted on groups with only two questions to test the suitability for analyzing those data as a group (Eisinga et al., 2012). Combining individual questions into groups overcomes their ordinal nature and yields interval data suitable for statistical tests (Norman, 2010). ANOVA and Tukey-Kramer post-hoc tests were conducted to analyze how different demographic and surf attributes influenced responses. T-tests were also conducted to determine whether sustainability attitudes differed from behaviors. The same process was replicated for the willingness to pay analysis to measure the degree in which different demographic factors and surf attributes had an influence. Willingness to pay, however, was not analyzed on a Likert scale, but instead, respondents were asked to select from pre-selected unequal ranges replicated from similar studies. This limits the ability to directly compare means between the Likert and the willingness to pay responses, but does not impact the ability to analyze different influences on each independently, which was the goal of this study.

4. Results

4.1. Demographic characteristics and surf attributes

After scrubbing the survey responses of duplicate IP addresses, there were 3,101 total respondents. After eliminating all respondents with incomplete responses to the questions used in this analysis, 2,199 responses remained (70.9% of the total). Even using the high-bar surf population estimate (35 million), this sample size satisfies Cochran's (1963) criteria for

a representative sample at 95% confidence and ± 3 confidence interval. The majority of the respondents were male (82%) between 26 and 54 years old, which is consistent with most other surf themed surveys (Sotomayor & Barbieri, 2016; Wagner, Nelson, & Walker, 2011). Half of the sample made less than \$75,000 USD per annum, which was found to be the mean income of surfers from California (Wagner et al., 2011). Most were from North America (56%), Australia (21%), and Europe (18%).

One-third of the sample categorized themselves primarily as shortboarders and most were advanced surfers. The majority spend between \$1,000 and \$5,000 USD (mean = \$1,999.5 USD) on their international surf trips, which most often last up to 3 weeks. Only 8% have never travelled abroad to surf, 32% have travelled to one or two other countries, 35% have been to three to five other countries and 25% have travelled to more than six other countries to go surfing. Only 8% were not willing to pay more for sustainable tourism products. Most (44%) were willing to pay between 6 to 10% more (mean = 8%).

4.2. Global surf tourism expenditure and the willingness to pay for sustainability

To estimate the amount spent on international surf tourism annually, published estimates on the total surf population were used to establish 17 million as the low (Lazarow et al., 2008) and 35 million as the high bar population estimates (O'Brien & Eddie, 2013; Porter & Usher, 2019). Findings on the frequency of international surf trips reported that 40% of surfers go on more than one trip per year (we conservatively estimated at 1.5/year), that 25% go on one trip annually, 11% go once every two to three years (we estimated at .42/year), and 24% reported 'irregularly' traveling abroad (Dolnicar and Flucker, 2003). Of those 24% who travel irregularly, we assumed, based on our survey, that 8% never travel and we estimated 0.2/year for the rest. This information was combined to arrive at a conservative multiplier of .928 international surf trips per surfer. Assuming \$1,999.5 is the average expenditure per trip, \$31.5 to \$64.9 billion USD per year was estimated to be the pre-COVID19 value of international surf tourism per annum (see Table 2). After correcting the mean hypothetical willingness to pay from our survey (8%) by Schmidt and Bijmolt's (2020) 21% inflation correction (6.32%), we also estimated that surfers are willing to pay between \$1.99 and \$4.1 billion USD more per year for sustainable surf tourism products (see Table 2).

4.3. Surfers attitudes about sustainable tourism

Our study was the first to include sustainability of providers into the rank order of surf tourism attributes used in other surveys. Our findings corroborate previous assertions that wave quality and crowding are the most important attributes to most surfers (Porter & Usher, 2019; Sotomayor & Barbieri, 2016), however, provider sustainability emerged as more important than other significant travel criteria such as safety, travel distance, and accommodation quality.

Despite the importance of sustainability, generally speaking, surfers did not feel that the surf industry was doing enough to be sustainable or that it was doing enough to provide for environmental and humanitarian organizations working in surfing locations. Surfers agreed, however, that they were more likely to buy sustainable surf products (i.e., rash-guards and wetsuits) if performance and cost were comparable. Surfers demonstrated an even stronger desire for surfboards made of sustainable materials (see Table 4).

Attitudes related to sustainable tourism scored very high among respondents (4.39), which was much higher than responses related to actual sustainable tourism behaviors (3.86) with statistical significance ($p < .001$). Interestingly, questions related to placing onus on surf tourism business to be socially (4.50) and environmentally (4.59) responsible scored much higher than questions related to individual ideologies such as: I look to be sustainable traveler when abroad (4.22) and I am concerned about sustainability in surf locations (4.21). Demographic factors impacted responses related sustainable tourism attitudes, but surf attributes did not (see Table 5). Women responded more favorably than men, and surfers between 26 and

34 responded more favorably than older surfers. Surfers making less than \$75,000 USD per year, reported a higher consideration for sustainable tourism attitudes than those in the higher income brackets, which was not expected.

4.4. Surfer sustainable tourism behaviors and willingness to pay for sustainable tourism

In terms of questions related to behaviors, generally speaking surfers reported the lowest score for having researched the sustainability of providers in the past (3.28), rated higher that sustainability is likely to influence their choice in the future (3.84 to 3.86), and highest when asked if they would choose a sustainable provider if price and amenities were comparable (4.44). Demographic factors followed the same trends as above for questions related to sustainability attitudes meaning women, younger, and lower income surfers reported the highest responses (see Table 4). The only addition being that Australian/Oceanians rated the importance of sustainable travel behaviors the lowest, which did not carry over in to the willingness to pay analysis, but is worth further attention.

Surf attributes, however, did influence responses related to surf tourism actions and behaviors. Those with higher ability levels, valued sustainability less. Longboarders also reported higher scores than shortboarders. The number of countries a surfer has visited did not impact responses in a

significant way. Those who spent between 3,000 and 4,999 on their last trip scored the lowest.

Forty-four percent of surfers reported willing to pay 6 to 10 % more than they paid on their last trip for one they deem to be more sustainable. Female surfers and long-boarders demonstrate a statistically significant higher willingness to pay than men and shortboarders. The higher the ability level, the less surfers were willing to pay for sustainable surf tourism (See Fig. 1).

5. Discussion

5.1. Global surf tourism expenditure

Using light emissions as a proxy for economic activity, McGregor and Wills (2016) calculated that individual surf-breaks generate between \$18 and 25 million USD (depending on their quality) for a total global value of \$51.2 billion USD. This supply-side approach used only one user generated internet forum to locate surf-breaks and rate wave quality, and it did not attempt to tease out surf tourism’s contribution, which was a major aim of this research. In addressing the first aim of this study we employed a direct cost method to propose the value of international surf tourism expenditure to be between \$31.5 and \$64.9 billion USD annually. While at first glance, it seems our estimate is consistent with McGregor and Wills’ (2016), it should be noted that they estimated the total value of global

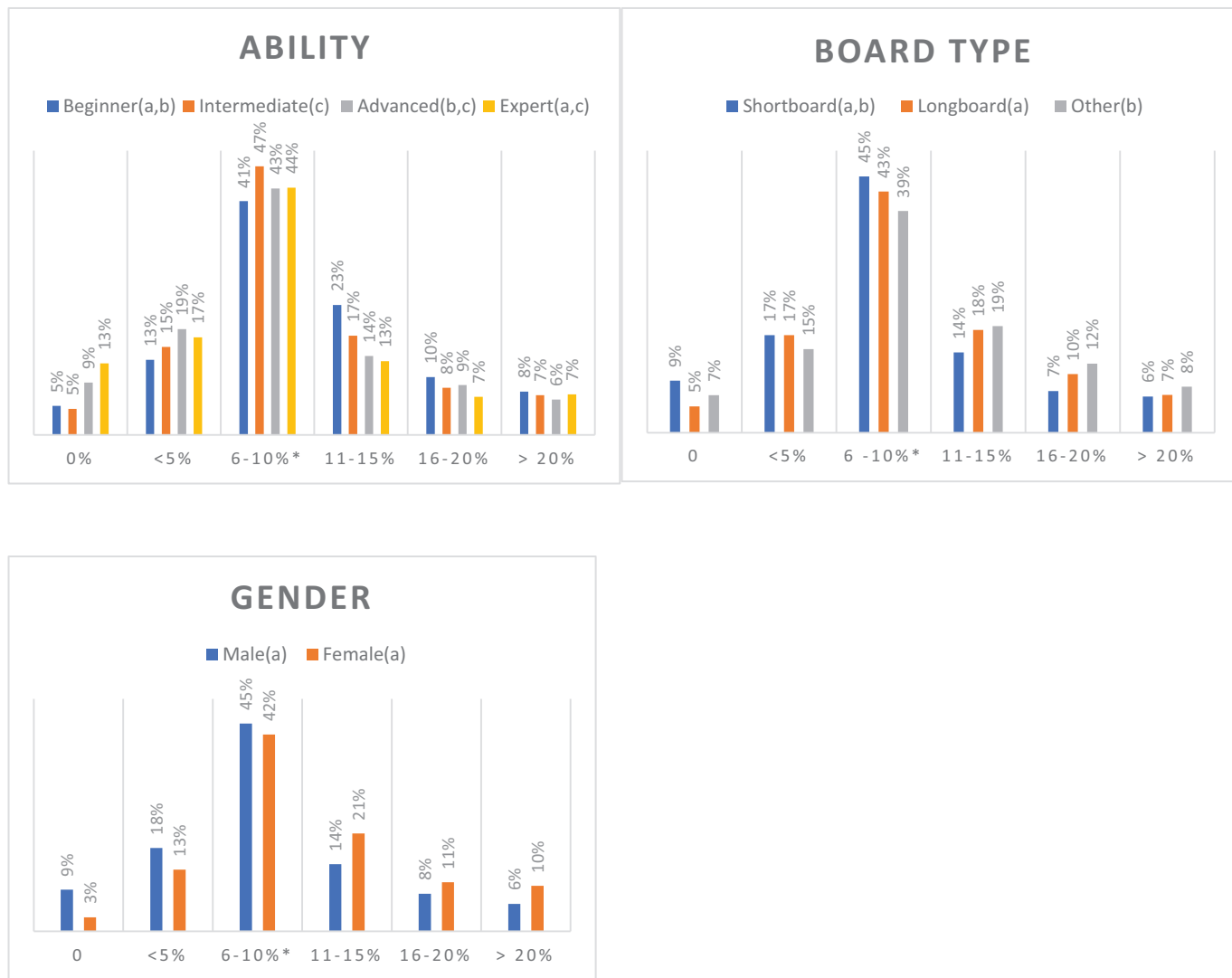


Fig. 1. Willingness to pay more for sustainable surf tourism: Attributes with statistically significant differences. Common superscript letters indicate significant pairwise differences as determined by Tukey-Kramer post-hoc analysis assuming $\alpha = 0.05$. *Indicates the mean interval.

wave resources, inclusive of property being purchased and built, businesses developing, local travel, and general economic activity sparked by surfing. This means we are placing a much higher valuation on wave resources, as international surf tourism expenditure remains an unknown fraction of total wave resource value at this point.

Regular daily expenditures for surfing (i.e., surfers traveling to their local surf-breaks), domestic surf trips, or spending associated with guests who accompany surfers were not included in our valuation. The latter is significant because Porter and Usher (2018) found that 19% of surfers typically travel with non-surfing spouses, partners, or children. Domestic surf tourism also remains a large, understudied market of unknown value. One study found that more than 58% of surfers drive more than 40km at least once a year to surf in their home countries in response to favorable short-term surf forecasts (Mach et al., 2018). In the USA, surfers on average, travel 10 miles to surf around 100 times per year, spending \$40 USD each time – resulting in a valuation of regular surfing activity in the United States of around \$3 billion USD per year (Wagner et al., 2011). Thus, the international surf tourism expenditure estimate provided here represents only a fraction of the economic value generated by surfing and surf travel more broadly. In addition, the geomorphological and bathymetric features that produce quality surfing waves provide ecological benefits and services including the generation and maintenance of sandy beaches that attract other coastal tourists and buffer against sea-level rise, and the provision of critical habitats for many species of plants and animals.

The empirically derived, pre-COVID-19 baseline expenditure estimate for international surf tourism developed in this manuscript is not argued to be directly comparable to the dive and snorkeling tourism valuations previously cited, but positions international surf tourism in the same ballpark. The numbers of snorkelers (20 million) and divers (6 million) worldwide (DEMA, 2019), are also broadly similar to the number of surfers. Despite surfing tourism’s greater pool of participants and comparable economic value, dive and snorkeling tourism receives considerable attention as a contributor to a “blue economy” and a key driver for the creation of marine protected areas (Phelan, Ruhanen, & Mair, 2020; Spalding et al., 2017; Brumbaugh, 2017; United Nations, 2019) while surfing is ignored. Surfing tourism thus appears to be a significant, yet overlooked, tourism niche that should be included in multi-lateral discourse around funding mechanisms associated with Sustainable Development Goal 14 (life below water) and the ‘blue economy.’

While dive tourism in low-and-middle-income countries often involves shuttling tourists directly to foreign owned high-end resorts causing significant economic leakage (Phelan et al., 2020), pre-COVID-19 surf tourists valued cross-cultural interaction with local communities (Barbieri et al., 2014) and many utilized locally owned accommodations (Dolnicar and Fluker, 2003). Significant segments of the surf tourism market also match the profile of younger, more adventurous, crisis resistant tourists (Hajibaba, Gretzel, Leisch, & Dolnicar, 2020; Peters, Peters, & Peters, 2020) who place less value on social interaction with other tourists, and specifically seek out remote areas with few other surfers (Porter and Usher, 2019). Psychographic and behavioral patterns that suggest surf tourism could play a significant role in leading a post pandemic tourism resurgence that brings economic benefits directly to local communities.

It is important to note that restarting surf tourism before widespread immunization and immunity could potentially cause spikes in virus cases in surf tourism destinations. This may be of particular concern in low-and-middle-income countries with limited resources to implement best preventive practices (i.e., temperature checks and sanitation stations). Indeed, surfers from California have been noted flocking to neighboring Mexico causing congestion at airports and in remote surf destination communities, bringing with them the potential spread of disease among surfers and into host communities (Tierney, 2020). Our findings should lend urgency to the provision of support to assist areas likely to receive pent-up demand from younger, lower spending, crisis resistant surf tourists. Additionally, COVID-19 health and safety concerns may prove to nudge some surfers towards spending more for things like fully catered surf trips in an all-inclusive setting (i.e., liveaboard charter boat trips and self-contained

Table 1
Demographic information, surf and travel attributes (n 2,199).

Demographic information	%	Surf and travel attributes	%
Gender		Primary Board Type	
Male	82%	Shortboard	66%
Female	18%	Long board	25%
		Other (SUP, Bodyboard)	9%
Age		Ability	
18-25	15%	Beginner	9%
26-34	27%	Intermediate	28%
35-54	50%	Advanced	52%
55 or over	8%	Expert	11%
Income		Countries Surfed in	
< \$75,000	51%	None	8%
75,000-\$150,000	34%	1-2	32%
>\$150,000	16%	3-5	35%
		6-10	18%
		11 +	7%
Country of Origin		Cost of Last International Trip	
South America	2%	Below \$1,000	19%
North America	56%	1,000-2,999	43%
Europe	18%	3,000-4,999	21%
Australia (Oceania)	21%	5,000 +	17%
Africa	1%	Duration of Last International Trip	
Asia	2%	< 1 Week	44%
		1-3 Weeks	43%
		3-3 Months	10%
		> 4 Months	5%
		WTP More for Sustainable Tourism	
		0%	8%
		< 5%	17%
		6-10%	44%
		11-15%	16%
		16-20%	9%
		> 20%	7%

Table 2
Estimated value of international surf travel expenditure and willingness to pay for sustainable tourism.

	Low estimate	High estimate
Global surf population	17 million ^a	35 million ^b
Annual international trips per surfer ^c	.928	.928
Annual international trips per year	15.8 million	32.5 million
Total international surf tourism expenditure per year ^d	\$31.5 billion USD	\$64.9 billion USD
Willingness to pay more for sustainable tourism products ^e	\$1.99 billion USD	\$4.1 billion USD
Willingness to pay more for sustainable tourism products per surfer per trip		\$126.4

^a Surf industry manufacturers association’s (SIMA) low estimate for the global surf population and this number is also cited in other sources as the low estimate (Lazarow et al., 2008; Surfer Today, 2020).

^b This is the most cited number (O’Brien & Eddie, 2013; Porter & Usher, 2018), but some sources suggest the high bar may be as high as 50 million (Lazarow et al., 2008).

^c This factor was created from the estimate that 40% of surfers reported going on more than one trip per year (we conservatively estimated at 1.5/year), that 25% of surfers reported one trip annually, 11% reported once every two to three years (we estimated at .42/year), and 24% reported ‘irregularly’ traveling abroad (Dolnicar & Fluker, 2003). Of those 24% who travel irregularly, we assumed, based on our survey, that 8% never travel and we estimated 0.2/year for the rest.

^d Based on our survey which found the mean interval selected was \$1,000 to \$2,999 which we took the average of to suggest that the average expenditure per international trip was \$1,999.5 USD.

^e Based on our survey which found the mean interval selected as 6 to 10%, which we took the average of to suggest surfers are willing to pay 8% more for sustainable tourism products on average, which was corrected to 6.32% to correct for hypothetical willingness to pay bias (Schmidt & Bijmolt, 2020).

Table 3
Rank order of surf tourism attributes.

Rank order		Borda count	% Ranked first
1	Wave quality	22007	53.8
2	Trip cost	18252	11.3
3	Crowding	17973	14.4
4	Destination culture	14401	4.8
5	Pristine natural environment	14086	4.7
6	Sustainability of providers	12770	1.4
7	Safety	11831	6.1
8	Travel distance	11494	2.1
9	Accommodation quality	9945	0.4
10	Bucket list waves	6640	0.7
11	Guiding services	5736	0.3

island lodging) that insulate tourists from local communities and other tourists. This may help limit disease spread, but poses sustainability concerns as local communities rarely experience significant economic benefits from this style of surf tourism (Ponting, McDonald, & Wearing, 2005; Towner & Davies, 2019). While our results show that guiding services were the lowest ranked surf tourism attribute before COVID-19 (Table 3) and that the group of surfers who spent more than \$5,000 USDs on their last trip represented the smallest proportion of the sample (Table 1), these considerations may increase in importance and in scale respectively in response to short run health concerns associated with the pandemic. In short, the baseline provided here enables future research to gauge where the surf tourism market is in the recovery process and track changes in general market characteristics.

5.2. Attitudes and actions related to sustainable tourism

The widely noted attitude-behavior gap in sustainable tourism (Mkono & Hughes, 2020; Pulido-Fernández & López-Sánchez, 2016) holds true among surf tourists. While surf tourists appear to care deeply about sustainability issues in surf tourism, scores reflecting personal sustainability behaviors are significantly lower. At the same time, surf tourists have an expectation that surf tourism providers will be actively engaged in sustainable tourism initiatives. Surfers ranked the sustainability of surf tourism providers as their sixth most important concern and subsequently environmental sustainability was found to rank slightly higher than social sustainability measures, which might be expected given that a pristine environment is a critical symbolic element of surfing destinations (Ponting, 2009).

The results of this study indicate that female surfers, younger surfers, and lower income surfers value both sustainable attitudes and behaviors

Table 4
Responses to sustainability questions.

Question/group n 2,199	Question mean (SD)	Group mean (SD)	Cronbach's Alpha/Spearman's ^a
General (Surf Industry)		N/A ^b	.59
Ensures its production, distribution and products are sustainable	2.77 (1.03)		
Provides sufficient support to environmental and humanitarian non-profits working in surfing locations	3.12 (1.01)		
Product Behavior		N/A	.45
More likely to buy a surf product that is sustainable	3.93 (.83)		
If performance and cost were comparable, I would buy a surfboard made from sustainable materials	4.47 (.70)		
Tourism (Attitudes)		4.39 (.52)	.83
I am concerned about sustainability in surf destinations	4.21 (.73)		
I look to be a sustainable Traveler when abroad	4.22 (.73)		
Surf travel businesses should be undertaking sustainability initiatives	4.41 (.67)		
Surf tourism businesses should take responsibility for supporting local communities	4.50 (.63)		
Surf travel businesses should be responsible for protecting the environment	4.59 (.58)		
Tourism (Behaviors/actions)		3.86 (.68)	.80
I have researched the sustainability performance of surf tourism businesses in the past	3.28 (1.03)		
Would choose a sustainable tour operator if price and amenities were comparable	4.44 (.68)		
Sustainability is likely to influence my choice of a surf tourism Business	3.84 (.85)		
In the future I am likely to research the sustainability of surf tourism businesses	3.86 (.84)		

^a Spearman-Brown's rank correlation analysis was used when there were less than three questions per group.

^b Group means not displayed when correlation coefficients or Cronbach's alpha's are not high enough to justify pulling questions into groups or constructs.

more highly than other groups. Additionally, those who predominantly ride short-boards, and those with higher ability levels see less value in selecting sustainable tourism providers. Future research could explore the implications of this finding as it is likely that expert surfers will be among the most likely to travel before the pandemic is finally under control. They may value the type of very remote insulated trips that provide fewer local benefits, which might have implications for more crowded surf destinations that are heavily reliant upon consistent surf visitation. Future research could usefully examine surfer expectations related to specific provider sustainability measures, and gauge their alignment with the most impactful measures, and offer practical guidance for both educating surf tourists about impactful sustainability initiatives to support and helping surf tourism providers to prioritize which sustainability practices to implement.

5.3. Willingness to pay for sustainable options

As an exploratory study into sustainability and surf tourism, rather than supplying a definition of sustainability, participants were asked how much they paid for their last surf trip and then asked how much more they would be willing to pay in the future, if the trip was demonstrably more sustainable. High proportions of surf tourists reported that the sustainability of their trip was important to them, a far lower (but still relatively large) proportion are likely to act upon that concern with many preferring to delegate responsibility to their surf tourism providers. The encouraging news is that this study, and others, show that surf tourists appear to be prepared to pay the surf tourism industry to do the work for them, and at far higher rates than the general travelling public. For example, Frank et al. (2015) found that 86% of surf tourists visiting Algarve, Portugal were willing to pay an accommodation tax earmarked for environmental protection, a number comparable to our results (92%). Also, in Portugal's Algarve, Valle et al., found that only 19% of sun and beach tourists were willing to pay into a fund earmarked for environmental protection. A similar study found that only 27% of tourists visiting Andalusia, Spain were willing to pay more for environmental preservation. Thus, for coastal locations seeking to attract lower volumes of tourists with a higher willingness to pay for destination sustainability, surf tourism may be an appropriate market niche to pursue.

The results of this study support the idea that pre-COVID 19 international surf tourists may be considered a lifestyle of health and sustainability or environment-friendly tourist segment (Moeller, Dolnicar, & Leisch, 2011; Nickerson, Jorgenson, & Boley, 2016), with a propensity to pay more for sustainable tourism. Indeed, taking into account the assumptions and wording used in the survey undergirding this research, surf tourists

Table 5
Attitudes and actions related to sustainable tourism

	Sustainable tourism attitudes	Sustainable tourism actions
Sample-wide Mean (SD)	4.39 (.52)	3.86 (.68)
Gender		
Male (1803)	4.35 (.53) ^a	3.79 (.69) ^a
Female (396)	4.52 (.50) ^a	4.09 (.65) ^a
F-value	38.12	67.29
P-value	<0.0001* ¹	<0.0001*
Age		
18-25 (330)	4.41 (.51)	3.94 (.66) ^{a,b}
26-34 (594)	4.46 (.47) ^{a,b}	3.96 (.63) ^c
35-54 (1099)	4.34 (.56) ^a	3.77 (.71) ^{a,c,d}
55+ (176)	4.32 (.55) ^b	3.76 (.75) ^{b,d}
F-value	7.93	13.9
P-value	<0.0001*	<0.0001*
Income		
<\$75,000 (1121)	4.42 (.51) ^{a,b}	3.92 (.66) ^{a,b}
75,000-\$150,000 (746)	4.36 (.52) ^a	3.79 (.70) ^a
>\$150,000 (332)	4.31 (.60) ^b	3.73 (.76) ^b
F-value	6.67	14.45
P-value	.0012	<0.0001
Country of Origin ²		
North America (1185)	4.34 (.67)	3.90 (.70) ^a
Europe (395)	4.31 (.56)	3.88 (.62) ^b
Australia/Oceania (462)	4.30 (.56)	3.67 (.70) ^{a,b}
F-value	1.01	7.83
P-value	.36	<0.0001
Ability		
Beginner (198)	4.44 (.51)	4.04 (.64) ^{a,b}
Intermediate (616)	4.40 (.53)	3.91 (.66) ^c
Advanced (1143)	4.36 (.52)	3.79 (.69) ^{b,c}
Expert (242)	4.38 (.60)	3.79 (.76) ^a
F-value	1.83	10.96
P-value	.14	<0.0001*
Countries Surfed In		
None (176)	4.29 (.61)	3.85 (.70)
1-2 (703)	4.38 (.50)	3.85 (.68)
3-5 (769)	4.39 (.51)	3.84 (.68)
6-10 (396)	4.41 (.54)	3.83 (.70)
11+ (155)	4.36 (.64)	3.89 (.80)
F-value	1.82	.27
P-value	.12	.90
Board Type		
Shortboard (1451)	4.37 (.53)	3.81 (.70) ^a
Long board (550)	4.41 (.53)	3.92 (.67) ^a
Other (SUP, Bodyboard) (198)	4.36 (.56)	3.91 (.68)
F-value	1.26	7.15
P-value	.28	0.0008*
Cost of Last International Trip		
Below \$1,000 (418)	4.40 (.52)	3.91 (.66) ^a
1,000-2,999 (945)	4.38 (.52)	3.84 (.68)
3,000-4,999 (462)	4.37 (.52)	3.75 (.71) ^{a,b}
5,000+ (374)	4.30 (.76)	3.91 (.84) ^b
F-value	.86	3.6
P-value	.46	0.012

¹ *p-value below 0.01; means with common superscript letters indicate significant pairwise differences as determined by Tukey-Kramer post-hoc analysis assuming $\alpha = 0.05$.

² South America 3.88(.62); Africa 3.88(.73); Asia 3.79(.66) not shown due to small sample size and lacking significance.

are willing to pay a total of \$1.99 to \$4.1 billion USD more each year for something that they deemed missing, in terms of sustainability performance, from their last surf vacation.

It has been previously concluded that experienced surfers represent a very attractive market segment that should be pursued to maximize economic benefits for surf tourism destinations (Dolnicar & Flucker, 2003; Hritz & Franzidis, 2018; Sotomayor & Barbieri, 2016). Our findings suggest caution be taken with this assumption. The results of this study show that experienced surfers scored lower on sustainable behaviors and demonstrate a lower willingness to pay for sustainability than their less experienced counterparts. Experienced surfers also demonstrate less destination fidelity and take a greater proportion of the available waves when they are surfing,

reducing the perceived value of the experience for other groups (Mach et al., 2018). Combined, these factors may indicate cause for pause when assessing the attractiveness of this segment. Future research might usefully investigate the inverse relationship between surfing skill and sustainability actions (and willingness to pay) and provide insights into to how this trend might change in the future. Conversely, female surfers and long-boarders demonstrated a higher willingness to pay for sustainable products and surf tourism, than males and shortboarders. It may be the case that differences between different sub-cultures of surf tourists warrant exploration of different ethics and adopted practices and how these influence surf travel demand. This line of enquiry could be beneficial for destinations and also help to challenge the narrative of a hegemonic surfer habitus (Ford & Brown, 2006; Krause, 2012) which is often analyzed from a dominant white male shortboard perspective (Olive et al., 2015) and move towards understanding and respecting the growing diversity within the surfing population.

6. Conclusions

As the COVID-19 pandemic evolves and surf tourism re-emerges, what will it look like and how will it compare to the market prior to this unprecedented breakpoint? Will surfers travel more or less often, will they go on fewer but longer trips, will spending patterns change, or will they value sustainability more? Utilizing the largest global sample of surfers to date, this manuscript addressed two core aims: to provide a pre-COVID-19 value of international surf tourism expenditure; and, to establish a baseline understanding of surfer's attitudes about, actions supporting, and willingness to pay for, sustainable tourism. The results presented here represent essential baselines for future research.

In terms of international surf tourism expenditure, even the low estimate of \$31.5 billion USD should bring surfing into serious macro-scale "blue economy" discussions related to sustainable development options in remote communities through tourism. If the economic value of coral reef-based dive/snorkeling tourism justifies creating nationally/internationally recognized protected areas, then, the estimates presented herein suggest, surf tourism ought to as well. This also opens space to consider prioritizing the preservation of blue spaces that appeal to surfers and other types of ocean sports enthusiasts and also to effectively consider the value of preserving surf-breaks beyond travel expenditure. Regardless, omitting surfing from UN agency reports, conferences and research on the "blue economy" that conceptualize and approximate the touristic value of aquatic ecosystems is an oversight that needs to be addressed, particularly as surfers are more likely than many other segments to begin traveling when international borders re-open for tourism.

Presenting this call for legitimizing surfing tourism in these broader discussions and forums, is not meant to suggest that surf tourism outcomes will be inherently sustainable without conscious efforts by all stakeholders involved to move in that direction (Arroyo, Levine, & Espejel, 2019; Mach & Ponting, 2018; Scheske et al., 2019). Despite this, the results are encouraging for an economically viable and sustainable future for surf tourism and provide direct avenues for future research. Surfers not only expect that their tourism providers undertake sustainability initiatives, but they are willing to pay billions more on aggregate for experiences that they view as sustainable. While there may not be evidence that investing in sustainability makes sense from a strict economic standpoint in many tourism sectors (Hibbert et al., 2013; Valle, Pintassilgo, & Matias, 2012; Weber, 2019), international surfing tourism seems to follow other sectors where ethical tourism product purchasing is important (Dolnicar, Crouch, & Long, 2008; Hedlund, 2011; Nickerson et al., 2016).

Further research is warranted to discover the types of sustainable practices surfers have specific willingness to pay for (i.e., local ownership and hiring, carbon neutral transport, zero waste, etc.) and the most effective ways to reach surfers with this information. At the very least, these finding should encourage surf tourism providers to consider their practices and the potential value associated with investing in sustainable practices. One of the main gaps between attitudes and behaviors was found because surfers

ideologically favored sustainable practices, but did not report researching the sustainability of providers. This provides an opportunity, we argue, for the growing body of surf related non-governmental organizations (i.e., Surfrider foundation and Save the Waves Coalition) and other global surf entities like the World Surf League to consider trying to educate surfers on the importance of this practice to help usher in more sustainable outcomes from surf tourism around the globe.

This study revealed a concerning trend that surfers with higher ability levels place less emphasis on sustainable travel behaviors and are willing to pay less for sustainability than other groups of surfers. If expert surfers travel more, why would they value sustainability less? Our data suggests that the number of locations visited does not greatly impact willingness to pay for sustainable tourism, so the answer must lie elsewhere. This is an interesting topic for future research.

In closing, this manuscript revealed that prior to COVID-19, international surf tourism generated significant economic activity and that surfers were receptive to supporting and paying more for sustainable tourism offerings. As tourism emerges from the pandemic, these results can, and should be leveraged for sustainable development initiatives in many remote coastal communities around the world that could benefit from surf protected areas and/or ethical and sustainable surf tourism development. The results presented here provide useful baselines for future analyses dedicated to the pandemic's impacts on international surf tourism.

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