

COMMENT OPEN



Mental health contribution to economic value of surfing ecosystem services

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Conservation of nearshore marine ecosystems gains political support from the economic value of cultural ecosystem services from surfing. This contribution is greater if the mental health benefits of surfing are included. For the Gold Coast, Australia, these are estimated at ~US\$1.0–3.3 billion per year. Mental health benefits from surfing comprise 57–74% of the total economic benefits of surfing; 4.4–13.5 times direct expenditure by surfers; and 4–12 times economic effects via property and inbound tourism. For the 50 million surfers worldwide, these translate to a global estimated value of ~US\$0.38–1.30 trillion per year. Greater accuracy will require multi-year panel studies.

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INTRODUCTION

Ocean sports such as surfing can provide critical economic and political leverage for the protection of coastal ecosystems, e.g., via surfing reserves¹. Currently, this leverage is rarely large enough to outcompete coastal development projects such as mineral loading wharves, boat harbours, residential resorts, or road bridges². We suggest that it could be increased by including the economic value of associated mental health benefits, derived from factors such as reduced healthcare costs and greater workplace productivity³. That value has been calculated for visits to national parks⁴, with the current best estimate of US\$5.1 trillion worldwide⁵: ~8.5 times greater than economic values derived from park tourism and recreation expenditure, even including travel costs and travel time⁴. Surfing is a more frequent and intense activity than park visits⁶, likely to have greater effects on *per capita* mental health gains and economic value. Here we make a first estimate of that value.

Our aim here is to estimate the large-scale economic value of mental health benefits across the entire representative population of individuals who take part in recreational surfing. This is a similar approach to previous estimates for visitors to national parks^{3–5}. For terrestrial national park visits, the majority of visitors are mentally healthy, but the therapeutic mental health benefits for individuals in poor mental health are 2.5 times greater, on average than preventive benefits for those in good mental health³. Similarly, in recreational ocean surfing, most participants are mentally healthy⁶, and surfing is a mechanism to maintain their mental health. Our economic estimates here focus on this aspect.

This appears to be a novel approach, distinct from previous research. There is a small body of prior research on the psychotherapeutic effects of guided surf programs, especially for those suffering mild but chronic mental ill health, at various ages^{1,7–9}. There are larger bodies of research first, across multiple outdoor adventure activities⁹; second, for mental health benefits of oceans and other natural water bodies, known as blue space^{1,10}; and third, for the role of cultural ecosystem services, such as mental health services from surfing and other beach and marine activities, in ocean sustainability¹. Surfing is a popular nature-based activity in Australia, reliant on publicly owned lands and oceans¹¹.

METHODS

Obstacles

The mental health effects of surfing are not easy to measure accurately. Direct psychological benefits accrue to individual surfers, but economic benefits also accrue to other stakeholders, such as employers and health insurers⁴. Surfers are a small and non-random subgroup of national populations¹¹. Frequencies and intensities of surf sessions for different individual surfers are highly skewed^{6,11}, depending on interest, expertise, and opportunity, which are influenced by geographical, demographic, socioeconomic, and personality factors. Mental health benefits may differ in degree, from occasional to frequent surfers. Different sessions for the same individual surfers may yield different mental health outcomes. Outcomes may sometimes be perceived as negative, with injuries and overcrowding as principal causes⁹. As with many thrill+skill adventure activities¹², surfing can act as a behavioural addiction: at least some surfers suffer substantial withdrawal symptoms if deprived of surf¹².

Case study site

For economic valuation, mental health benefits acquired via surfing may also lead to large-scale lifestyle choices, such as residential location and work preferences, and these create secondary economic effects, e.g., via property prices¹³. The economic value of surf amenities also overlaps with beach amenities more broadly¹⁴. Taking all these factors into account, we estimated the mental health value of surfing for a case study site, the Gold Coast in Queensland, Australia, as follows. The Gold Coast is a beach tourist destination, with minimal manufacturing and negligible primary production industry. Its economy is driven largely by real estate, tourism, and trade and professional services such as building, healthcare and education. Its 2023 resident population is estimated at ~732,000. In 2008, there were 65,000–120,000 surfers¹³. Surfer numbers have doubled over the past 5 years alone¹⁵, so we can estimate >130,000 surfers currently. The mean number of beach visits *per capita* in Australia is 6 per year¹⁶. The mean number of surf sessions per Gold Coast surfer is reported at ~100/year¹³.

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Mental health valuations

We triangulated the economic value of mental health benefits from surfing using the two different estimation methods currently available^{3–5}. The simplest of these⁴ relies on a standard health economics concept, financial value of a quality-adjusted life-year, \$/QALY. This is the mean amount that a society pays, from all sources, for all medical treatments to improve individual quality of life, standardised for a year with zero loss of life quality^{4,5}. At the population scale, \$/QALY can be used to calculate the economic value of small marginal changes in measured quality of life⁴. This is a standard method in health economics but is rarely used for government budgets overall. The alternative approach³ calculates economic values only from mental-health effects on taxable economic productivity and reduced healthcare costs. These parameters are included routinely in whole-of-government budget processes.

Limitations

For surfing, both these estimation methods rely on treating the economic values of mental health benefits from surf sessions as equivalent to those from national park visits. There are no known published quantitative comparisons. Qualitative research indicates that skill+thrill adventure recreation regularly generates powerful sensory and emotional experiences¹⁷ that enhance well-being outcomes¹⁸, whereas contemplative activities produce less powerful emotions, except occasionally¹⁹. Treating surf sessions as equivalent to park visits is therefore likely to underestimate the economic value of their mental health benefits. In addition, our calculations here consider only mental health effects, whereas surfing also generates physical health benefits, and those in turn yield secondary benefits for mental health²⁰.

Other economic pathways

To set these mental-health economic valuations in context, we also estimated economic values of surfing via other pathways, for the same case study site. These pathways are: direct surfer expenditure; proportional contributions to inbound tourism revenues; and proportional contributions to property income via rental income and capital asset appreciation. Statistical data to make these estimates is readily available, but they have not been made previously.

RESULTS

Mental health valuations

Using the two visit frequency figures as above, increasing mean visit frequency from 0 to 6 per year generates an estimated ~4% mean *per capita* increase in quality of life⁴. Using the \$/QALY method⁴, and quoting all values in US\$ at AU\$1.00 = US\$0.65, this gain is valued at ~\$8000 per year. The relationship between visit frequency and mental health benefits is non-linear⁴, and 100 sessions per year generate an estimated ~8% increase, ~\$16,000. Using the productivity + healthcare estimation method³, if surfing reduces stress from high to low levels¹, that creates an estimated ~10% improvement in *per capita* workplace productivity³, plus ~10% reduction in costs of mental healthcare³. Australian mean *per capita* GDP is ~\$45,500, and mental healthcare costs are ~10% of GDP⁴. The value of that stress reduction via surfing is thus estimated at ~\$5000 per person per year. Surfing thus contributes an estimated ~\$0.65–2.10 billion per year via surfer mental health benefits. This is injected directly into the Gold Coast economy via both employment and healthcare, so a standard impact multiplier of 1.6 indicates a total value of \$1.0–3.3 billion per year.

Table 1. Components of economic value for surfing on Australia's Gold Coast.

Component (no multiplier)	Annual value, US\$ billion
Mental health	0.65–2.10
Direct expenditure	0.23–0.43
Property, <i>pro rata</i>	0.25
Tourism, <i>pro rata</i>	0.017

Expenditure, tourism & property

We can compare this mental health value against other economic values of surfing (Table 1). It is 4.4–13.5 times inflation-adjusted estimates of direct surfer expenditure, which are \$0.23–0.43 billion per year for the Gold Coast¹³. Inbound tourism to the Gold Coast, for which beaches are the primary attraction but not the only activity, is currently valued at \$4.0 billion p.a.²¹. This includes ~48,000 surfers^{13,14} from 11.4 million tourists²¹, *pro rata* contribution of \$0.017 billion per year. The local government budget for 2023–24 is \$1.43 billion. Gold Coast beachfront high-rise residential apartments, that house residents and tourists attracted largely by beach amenities have an aggregate capital value of ~\$16.25 billion with a net rental return of 4.6% per year plus mean 35-year inflation-adjusted capital gain of 4% per year^{22,23}, creating pre-tax-annual value ~8.6% x \$16.25 billion, i.e., ~\$1.40 billion p.a. Since ~18% of the city population are surfers, surfing contributes ~\$0.25 billion per year. The mental health value of surfing is thus 4–12 times economic contributions via property prices.

SUMMARY

For the Gold Coast, therefore, mental health benefits contribute 57–74% of the total economic value of surfing, or 65–82% if multipliers are included. Scaling up to the estimated 50 million surfers worldwide¹, the global mental health value of surfing is \$0.38–1.30 trillion p.a. This is an approximate top-down estimate. For more accurate estimates at local scales, we shall need to track mental health measures and possible influential factors for large panels of surfers, over multiple years. This initial approximation, however, indicates that the economic and political power of surfing in the conservation of nearshore ocean ecosystems may be substantially more than suggested previously¹. It would be larger still if the benefits of surfing for physical health^{1,9}, and the secondary effects of physical health on mental health²⁰, were also included. Surfing can thus contribute significantly to ocean sustainability.

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COMPETING INTERESTS

The authors declare no competing interests.

ADDITIONAL INFORMATION

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