

Effects of Coastal Recreation on Social Aspects of Human Well-being

Melanie Cox^{1,2}, Ron Johnstone^{1,2} and Jackie Robinson^{1,3}

¹CRC for Coastal Zone, Estuary and Waterway Management

²Centre for Marine Studies, University of Queensland

³School of Economics, University of Queensland

m.cox@marine.uq.edu.au

ABSTRACT

Coastal ecosystems are under increasing pressures from a wide variety of human impacts. As the coastal zone provides many goods and services essential to the well-being of people, there is potential for changes in the condition of coastal ecosystems to have reciprocal impacts on the human population. Based on existing literature, it was hypothesised that changes in coastal ecosystem condition could affect aspects of social and community relations through affecting residents' coastal recreational activities, sense of place, social interactions and networks, health and overall quality of life. These relationships were investigated in the Pumicestone catchment in south-east Queensland with the aim of identifying the interactions between coastal condition and human well-being. Information on key variables was collected by surveying catchment residents, and data were analysed using path analysis. The results indicate that the recreation in coastal areas can impact on the well-being of coastal residents. Understanding the positive relationship between ecosystems and human well-being can potentially reduce the apparent conflict between environmental improvement and human interests, thus improving management of local ecosystems.

Key words: Ecosystem condition, recreation, sense of place, human well-being, Pumicestone catchment

Key learnings

1. Recreation in the coastal zone can affect residents' sense of place, social interactions, health and overall quality of life.
2. Effects of changes in the condition of coastal systems on human well-being need to be considered in coastal management.
3. Explicit recognition of the benefits of coastal ecosystems in good condition to the surrounding human population is potentially a powerful way to improve coastal management.

INTRODUCTION

The coastal zone plays an important role in the life of most Australians. Over 80% of Australians live within 100km of the coast, and this percentage is increasing. Coastal areas are in high demand for recreation, and are an important component of the Australian lifestyle. It has been recognized for some time that the coastal zone is under growing pressure from the increasing human population, and a large body of work has been and is being undertaken to assess the impacts of these pressures on the natural coastal ecosystems. However, despite the obvious importance of the coast to the well-being of people choosing to live in the coastal zone, there has been little or no attempt to assess the flow-on effects that changes in the condition of coastal ecosystems might have on the human population.

Natural ecosystems are hypothesised to affect human well-being in a variety of ways (Reid *et al.* 2002; Cox *et al.* 2003). The Millennium Assessment identifies five major components to well-being; security, freedom, basic material needs, health, and social relations. Of these, ecosystem condition is

not directly related to freedom, but may have some influence on the other components. Ecosystem condition and ecosystem services affect security through the ability to live in a clean place, and through reduced vulnerability to environmental shocks. Ecosystems provide most basic resources required for living, and are pivotal in the provision of food, clean water and air and absence of disease. Three links are identified between ecosystems and social relations; the ability to undertake recreation, the ability to experience cultural and spiritual values association with ecosystems, and the ability to learn about ecosystems. Cox *et al.* (2003) also identify potential impacts of ecosystems on sense of place, social interaction and networks, and aspects of social capital such as trust and reciprocity. Given the importance of the coastal zone in the daily life of Australians, the focus of this paper will be on the links between recreation in the coastal zone and social interactions and networks, sense of place and community, mental and physical health, and quality of life.

Recreation is an important component of social well-being as it provides benefits to physical and mental health, self-identity, skill development and learning, spirituality, social cohesion and community satisfaction (Driver *et al.* 1991). Coastal environments are an important part of many people's recreation in Queensland and the presence of healthy coastal ecosystems provides numerous opportunities for recreation. Neff *et al.* (2000) found that a natural setting was one characteristic related to people undertaking regular exercise and that the environmental setting was important in maintaining regular activity. Recreation may also lead to increased social interaction, an important component of well-being. Coastal ecosystems are likely to contribute to social interaction through the provision of common space that is aesthetically pleasing, attracts residents and provides a convenient setting for casual contact. For example, in city neighbourhoods it has been found that the presence of greenery led to a greater use of common spaces and face to face social contact (Kuo *et al.* 1998; Kweon *et al.* 1998). Casual face to face contact was in turn important in providing opportunities for the development of social relationships, and neighbours who had face to face contact were more likely to develop and maintain social ties. Social ties are in turn also important to overall health and well-being. A literature review of nineteen studies suggested that individuals with higher levels of social support had lower blood pressure levels and higher immune responses, and that in hypertensive people social support led to better blood pressure regulation (Uchino *et al.* 1999).

The coastal zone is also likely to affect individuals' sense of place. Sense of place can be generally defined as the relationship between people and spatial settings (Jorgensen and Stedman 2001), and can include attachment to a place, dependence on a place, identification and satisfaction with a place and sense of belonging to a place (Shamai 1991). Sense of place incorporates both social and physical aspects of place; attachment may be to the people or community living in a place, to aspects of the physical environment itself, or to both (Cantrill 1998). Sense of place is an important component of well-being as it forms part of an individual's identity, contributes to the creation of a group, neighbourhood or cultural identity (Williams *et al.* 1992; Chipuer and Pretty 1999). In an Alaskan study, communities that had stronger levels of place attachment were more cohesive and had a higher perceived quality of life (Brown *et al.* 2002). The physical environment is hypothesised to contribute to an individual's sense of place in recreational settings. Factors likely to affect the development of sense of place include features endemic to the local environment, personal and communal experiences and perceptions of the environment and information on the local environment from media and interpersonal networks (Williams *et al.* 1992; Cantrill 1998; Chipuer and Pretty 1999; Horwitz *et al.* 2001). The condition of local coastal ecosystems therefore has the potential to play an important part in development of a sense of place.

Health is a major contributor to overall well-being. Coastal ecosystems may affect both physical and mental health. Physical health may be related to coastal areas through encouraging exercise (Bauman *et al.* 1999; Ball *et al.* 2001), which increases overall health (Neff *et al.* 2000). The condition of the physical environment and, in particular, the naturalness of an area, can also potentially affect the degree of mental fatigue experienced by people living in that area. Several authors have shown that exposure to natural environments may result in faster recovery from a stressful event, better cognitive performance and higher scores on happiness and positive affect scales compared with experiencing an urban setting (Hartig *et al.* 1991; Ulrich *et al.* 1991), and residents in buildings with less vegetation

reported more aggression and violence and had higher levels of mental fatigue than those in identical buildings surrounded by trees and grass (Kuo and Sullivan 2001). Environmental degradation may also be associated with higher levels of stress, feelings of marginalisation, lower self-esteem, feelings of hopelessness and helplessness and lower levels of problem solving and support seeking (Van Haaften and Van de Vijver 1999; Horwitz *et al.* 2001).

It is therefore hypothesised that recreation in coastal areas contributes to overall well-being through enhancing social interaction and networks, increasing sense of place and improving physical and mental health. The aim of this paper is therefore to test this hypothesis using data from a case study in Pumicestone catchment in south-east Queensland.

METHODS

Study area

Pumicestone catchment is located about 61km north of Brisbane in south-east Queensland. The catchment is situated in Caboolture Shire and Caloundra City Council areas. The catchment area is approximately 1198km² (Eberhard and Manen 2001), and the population at the 2001 national census was 132 684 (Australian Bureau of Statistics 2002). The major industries in the region are manufacturing and retail. The average (mean) income is \$405 per week, and the average age is 37. The catchment extends south from Golden Beach at Caloundra to Deception Bay, and west to the D'Aguilar ranges. Pumicestone Passage itself is the shallow passage between the mainland and Bribie Island. It is home to many waterbirds, and is a popular spot for recreational fishing (commercial fishing is banned in the passage). Estuaries in the catchment include Caboolture River, Mellum, Elimbah, Burpengary, Bells, Coonowrin, Tibrogargen, Glass Mountain, Bullock and Ningi Creeks. Caboolture River flows into Deception Bay, and the creeks into Pumicestone Passage. The specific waterways of interest in the project were Pumicestone Passage, Caboolture River, Deception Bay, Bribie Island beaches and southern Caloundra beaches. These are shown on the map in Figure 2.

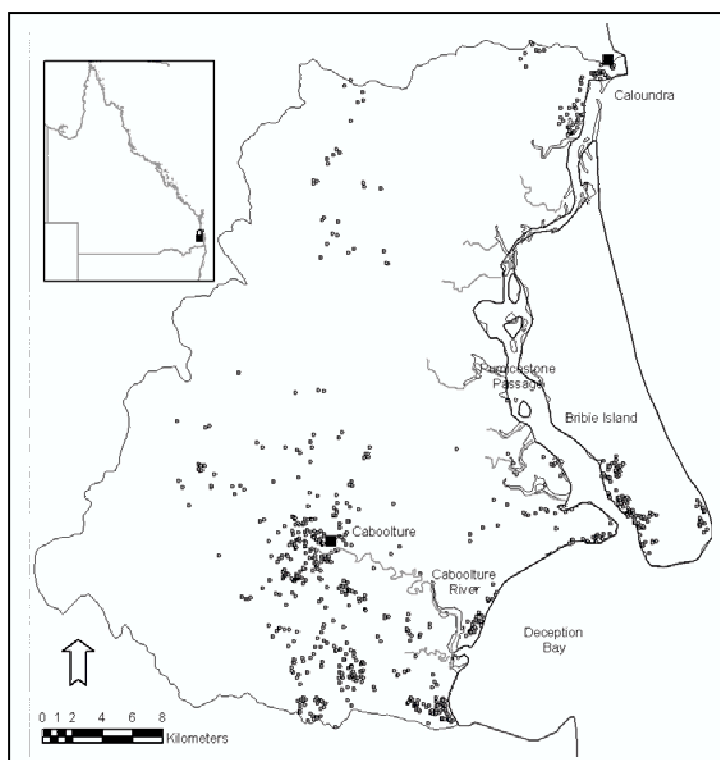


Figure 2. Map of the study area, showing major waterways and towns, and location of survey respondents.

Survey

A written survey was designed to obtain information on (among other things) perceived condition of the waterways, recreational use of the waterways, social interaction and networks, sense of place and sense of community, community involvement, health and quality of life. The survey was hand-delivered to 827 individuals throughout the Pumicestone catchment between April and July 2004. Residential addresses were selected randomly from the councils' digital cadastral database (DCDB). Researchers attempted to visit each of the selected addresses at least twice at different times; if residents were out both times, or refused to participate, the house next door was substituted. Researchers explained the purpose of the survey, and requested residents to complete the survey and return it in the supplied reply-paid envelope. Where requested by the resident, researchers completed the survey as an interview. No reminders were sent, as it would have been logistically difficult; however, articles were run in local papers to remind readers of the survey.

The survey consisted of two main sections. The first section included questions on sense of place, social interaction, physical and mental health and quality of life. The second section covered attitudes about the coastal environment, including perceptions of the condition of the five major waterways, number of visits to each waterway, benefits gained from recreation, social contact during waterway visits and general demographic information. Items related to the main variables assessed here are given in Table 1. With the exception of recreational visits, overall health and quality of life, all items were scored on a five-point Likert scale. Recreational visits were measured in actual number of visits in the previous twelve months; general health and quality of life were scored on a six point scale.

Table 1. Survey items and corresponding aggregated variables.

Variable	Survey Item
Recreational visits	Summed number of visits in the last year to all waterways
Social interaction	Visiting a waterway for recreation allows me to catch up with other locals
	Visiting a waterway for recreation allows me to be with friends or family
	When visiting a waterway for recreation, how often do you run into people you know?
	When visiting a waterway for recreation, how many people (who you know), would you normally see?
Social networks	How often do you generally see or talk with friends or family?
	How many close friends or family do you have?
Social Sense of place	I can recognise most of the people who live in this area
	When shopping in my local area, I am likely to run into people I know
Belonging Sense of place	I feel I belong in this area
	I would like to continue living in this area
	I feel at home in this area
Physical health	In general, how would you rate your overall health?
	How much do physical problems limit your usual activities?
Mental health	How much do personal or emotional problems limit your usual activities?
	How often do you feel calm and peaceful?
	How often do you feel energetic and lively?
	How often do you feel stressed and wound up?
	How often do you feel alone and isolated?
Quality of Life	In general, how would you rate your quality of life?

Analysis

Excluding responses that were not usable due to too many questions being missed, the results from 300 surveys are analysed here. Where only a couple of questions were missed, the average value was

substituted for the missing value. The relationships between the social variables and recreational visits were assessed using path analysis in the LISREL package version 8.51 (Jöreskog and Sörbom 2001). Path analysis is a useful tool for examining relationships between multiple variables, particularly where there are indirect or feedback relationships (Kline 1998). Single measured variables were created for each of the general variables by adding the scores for each item related to a general variable.

RESULTS

Comparison of the demographic characteristics of the respondents with those of the general population show that survey respondents were more likely to be female (63% of respondents, 51% in the general population) and have a higher level of education (eg 14.5% of respondents had a university education; 7% in the general population). The average age of respondents was similar to that of the general population (50, compared with 48 in the population over 18 years old). The results are therefore reasonably representative of the entire population.

The standardised results for the path analysis are shown in Figure 2. All paths were significant ($p < 0.05$), with the exception of the paths from visits to physical health and from networks to physical health. The model was overall a good fit (chi-squared=13.88 (df=12), $p=0.3$, RMSEA=0.023, AGFI=0.97). The equation for quality of life had an r^2 value of 0.52, and all variables (belonging sense of place, networks, mental health and physical health) were significant ($p < 0.05$). Recreational visits was also a significant contributor to quality of life in the reduced form equation ($p < 0.05$, $r^2=0.013$).

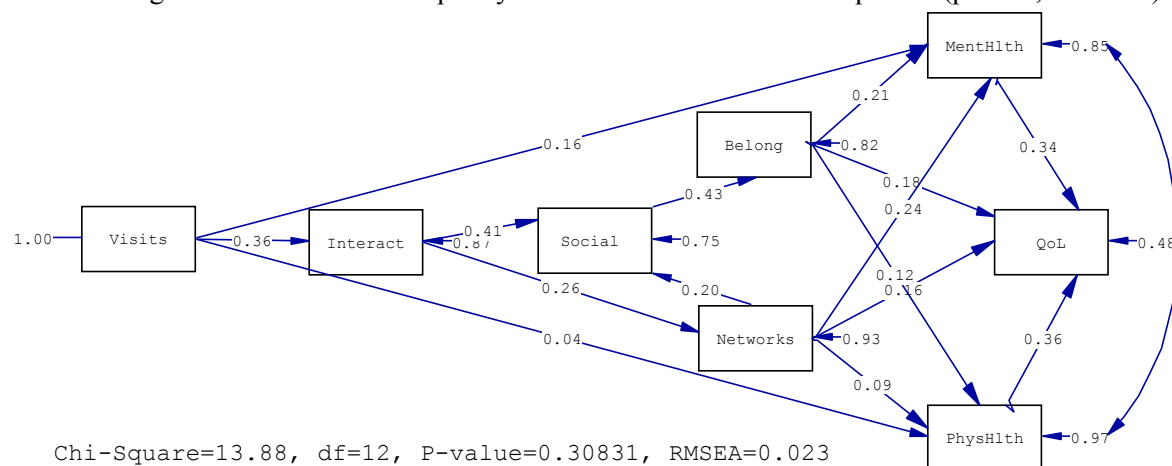


Figure 2. Standardised results for the path analysis and fit statistics.

SUMMARY AND CONCLUSIONS

The only part of the hypothesised model that was not supported by this analysis was the links to physical health from recreational waterway visits and networks. Previous work has showed very strong relationships between networks and health (eg (Berkman and Syme 1979). One possible reason for insignificant relationship found here is the items used to measure physical health. Only two items were used; the respondents’ ratings of their overall health, and the extent to which physical problems limited respondents’ activities. Of these, the second item is unlikely to be affected by recreational visits or networks. Using additional items to measure physical health may have been more useful.

The results presented above support the hypothesis that recreation in coastal areas contributes to overall quality of life or well-being though enhancing social interaction and networks, sense of place and psychological health. This has implications for the management of the coastal zone, in that it must be recognised that changes in the condition of coastal ecosystems potentially have wide ranging

effects on the well-being of the local human population. Maintenance or improvement of environmental condition is sometimes seen to be in conflict with the improvement of human well-being (e.g. environmental management may be seen to be cost large amounts of money, reduce jobs or economic production). However, human well-being is in reality intrinsically linked with the condition of the natural environment; it is natural ecosystems that provide all essential services (clean air, water, material cycling) and goods (through primary production). This study demonstrates that ecosystems are also important to overall well-being in terms of social relations. Recognition of the dependence of human well-being on the continued well-functioning of natural ecosystems is essential if we are to maintain and improve our future well-being.

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