

## ABSTRACT

HERRING, CHRISTINA MARIE. Coral reef valuation and perceptions of the tourism industry in Akumal, Mexico. (Under the direction of Gene Brothers, Ph.D.)

Natural resources are utilized and valued differently by various individuals and groups in coastal destinations. This creates a challenge for tourism planners and natural resource managers. Understanding values and perceptions that surround unique resources in tourism destinations hold answers to implementing effective management techniques. The purpose of this research was to study the values that visitors and local residents have toward the Mesoamerican Barrier Reef System (MBRS) in Akumal, Quintana Roo, Mexico, a coastal community located on the Yucatán peninsula.

Data were collected during May 2005 from two distinct groups who utilize the unique coral reef resource for different reasons. The study sample included visitors ( $n=98$ ), and local residents ( $n=21$ ). Information was obtained from the visitors at three local dive shops. Survey days and times were coordinated with the dive shop managers and a convenient random sample technique was employed. The local residents were chosen randomly at various tourism establishments (e.g.: restaurants, hotels and shops) in the town and they provided responses through individual interviews.

The findings hold positive implications for tourism management and future research in this region. This study reveals that visitors are concerned about valuing the reef for conservation but they are not completely satisfied with dive shop programs. By refocusing their efforts, dive shops could enhance their business and aid in the sustainable development of this region which depends upon proper resource management.

CORAL REEF VALUATION AND PERCEPTIONS OF THE TOURISM INDUSTRY  
IN AKUMAL, MEXICO

by

CHRISTINA MARIE HERRING

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APPROVED BY:

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Beth Wilson, Ph.D.

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Yu-Fai Leung, Ph.D.

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Gene Brothers, Ph.D.  
Chair of Advisory Committee

## DEDICATION

I would like to dedicate this work to my grandmother, Dorothy B. Schlaikjer who fostered my passion for nature.

## BIOGRAPHY

Christina Marie Herring, better known as Tia, is originally from Long Island, New York where her family members instilled in her the values of helping others and exploring the world. At a young age she developed a passion for nature and the outdoors.

Tia pursued an education degree at The Catholic University of America in Washington, D.C. She was involved in many activities during her undergraduate years including, varsity field hockey, student government and ministry activities. After completing her bachelors degree Tia served as an Agroforestry Peace Corps Volunteer in Panama from 1999 to 2001. In Panama, Tia taught sustainable farming techniques in a small indigenous community. Tia met her husband in the Peace Corps and upon completion of their service they hiked the entire 2,180-mile Appalachian Trail from Georgia to Maine.

Tia likens her work on this study to her work in Peace Corps; when one sets out to make a huge difference in the world and add immensely to the body of knowledge, they are quickly humbled to surrounding circumstances. The ultimate goal is to make an impact. Tia believes that if she has improved or had an impact on the lives of others then she has accomplished some important life goals. Tia enjoys a variety of outdoor activities and is always in search of exciting adventures.

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## CHAPTER 1.0: INTRODUCTION

The second longest barrier reef system in the world is located off the coast of Akumal, Quintana Roo, Mexico. The purpose of this study was to explore perceptions that visitors and local residents have toward the coral reef resource and tourism practices in this coastal tourism destination. Natural resources such as land, air and water are invaluable pieces of civilization from which humans and animals extract and receive benefits including nourishment, habitat and recreation. Unfortunately, researchers are reporting alarming findings about the decline of the world's natural resources (United Nations Development Programme, United Nations Environment Programme, World Bank & World Resources Institute, 2000; United Nations Environment Programme-World Conservation Monitoring Centre, 2005; World Resources Institute, 2005).

Coral reefs, wetlands, plant and wildlife populations are facing detrimental pressures like pollution (Schaffelke, Mellors & Duke, 2005), environmental change (Gardner, Côté, Gill, Grant, & Watkinson, 2003; Hoegh-Guldberg, 1999), and habitat destruction (Daby, 2003; Gössling, 2002; Tilman & Lehman, 2001). In addition, it has been documented that an influx in tourism to natural areas is affecting our natural resources (Gössling, 2002; Juárez, 2002; Buckley, 2000; Leung, Marion & Farrell, 2001), thus more effective tourism planning and management strategies may be necessary in order to ensure sustainable and successful tourism development. In tourism destinations natural resources are utilized and valued differently by various individuals creating a challenge to tourism planning. Therefore, understanding values and perceptions that

surround this unique resource holds answers to implementing effective management techniques.

The world's second most biodiverse ecosystem after tropical rainforests is the coral reef ecosystem. This is a vital natural resource that is commonly shared by individuals in coastal tourism destinations and was the focal point of this study. Coastal destinations offer many attractive amenities to their residents and visitors, including opportunities for marine-based recreation. This thesis is an analysis of the values and perceptions held by groups that intersect in a coastal tourism destination. The intention of the analysis is to reveal information about these different groups that may influence future management and planning within the region.

There were three main goals of this research they included; (1) the examination of values and perceptions of coral reefs, (2) identification of characteristics of tourism programs and activities that are important to visitors and, (3) assess local resident's perceptions of the tourism industry in Akumal. This research study employed a Principal Components Analysis to examine the visitors' perceptions of values of a coral reef. The study then implemented an Importance-Performance analysis to further identify the visitors' perceptions of specific program characteristics associated with marine-based activities offered at local dive shops. Finally, personal interviews were conducted in order to gather local resident perceptions and attitudes toward the growth and direction of the tourism industry in the region.

The first goal of this research was to analyze values and perceptions that visitors and local residents have toward the values of the Mesoamerican Barrier Reef System (MBRS). The concept of extracting value from a resource usually refers to economic

value (Rietbergen-McCracken & Abaza, 2000; Solow, 1994); however, this study strives to analyze the importance of aesthetic valuation to visitors and local residents. Boyd & Banzhaf (2005) advocate that "all of nature's benefits can be and should be measured, including nonmaterial, even spiritual benefits" (p. 17). In using the reef for diving, a visitor values the coral reef ecosystem for personal enjoyment whereas a local resident may value it for its fishing potential and its sustenance. The challenge is to develop management strategies which take all the different values into account.

Globally, millions of people depend on reefs for sustenance and livelihood (Wilkinson, 2004; Davidson, 2002) however; this important resource is particularly vulnerable and increasingly threatened (Birkeland, 1997; Wilkinson, 1998; Hoegh-Guldberg, 1999; Murphy, 2002; Wilkinson, 2004). The National Oceanic and Atmospheric Administration (NOAA) (2005) states that 10% of all coral reefs are degraded beyond recovery and 30% are in critical condition and may die within the next 10 to 20 years. The pressure, stress and impacts to coral reefs increase as human populations expand and develop in close proximity to coastal zones. According to Davidson (2002), "few people have ever had the privilege of seeing a coral reef in its natural setting; fewer still have seen a truly pristine reef. Of those who do encounter a reef, most have no idea that what they are witnessing may be gone in a few decades" (p. 500). In short, due to the threatened status of the reef and the increased amount of tourism to coastal destinations, it is clear that the coral reef ecosystem is a natural resource that deserves attention.

According to Hoegh-Guldberg (1999), "tourism is the fastest growing economic sector associated with coral reefs and is set to double in the very near future" (p. 839).

The state of Quintana Roo on the Yucatán peninsula is an ideal coastal tourism zone and visitation to this area is constantly increasing. Therefore, the second goal of this research was to aid dive shop managers and tourism planners by identifying characteristics of tourism programs in Akumal that are important to visitors. Over 3 million Americans travel to the Cancún region and area beach resorts each year, including over 120,000 during the two month spring break season (U.S. Department of State, 2006). The variety of marine-based activities and the vibrant underwater world of corals entice millions of individuals to travel to the exotic locations along the Yucatán's coast. Understanding what visitors are looking for in tourism programs and discovering whether they are content with their experiences can lead to enhanced sustainable tourism practices as well as increased customer satisfaction.

The U.S. Department of State (1998) reported that "one hundred million tourists visit the Caribbean each year and SCUBA diving in the Caribbean alone is projected to generate \$1.2 billion by the year 2005" (Hoegh-Guldberg, 1999, p. 839). More and more travelers strive to incorporate marine based activities into their travel plans and divers in particular travel around the world to experience the amazing world of corals. In 2004, 5.5 million Americans participated in snorkeling and 1.5 million Americans participated in open-water SCUBA diving (National Sporting Goods Association, 2005). Akumal is known as a quiet town with a premier dive site therefore, travelers are increasingly drawn to the region in search of a tranquil and serene area to participate in marine activities. In short, Akumal, Quintana Roo, is an example of an expanding town situated in the heart of the tourism corridor in this region. By offering a variety of opportunities to visitors such as diving, snorkeling, boat rides, and deep-sea fishing expeditions, visitation to this town

is projected to increase. Learning about the visitors is the key to understand how to manage their interaction with the coral reef ecosystem.

All humans have senses but the way the senses are used lead individuals to develop different perceptions of the world around them. There are many ways to compare the development of human perceptions such as man versus woman, young versus old, local versus visitor (Tuan, 1974). In Akumal, the visitors and local residents develop perceptions toward the coral reef for different reasons. Tuan states that "the visitor (particularly the tourist) has a viewpoint; his perception is often a matter of using his eyes to compose pictures. The native, by contrast, has a complex attitude derived from his immersion in the totality of his environment" (p. 63). This example emphasizes that individuals who experience a place for an extended period of time develop a stronger attachment to the destination. In turn, this attachment increases the influence on an individuals' development of values and perceptions toward the area. In short, the third goal of this research was to assess the local resident's perception of the growth of the tourism industry which relies on the coral reef ecosystem in their home.

In conclusion, this thesis reveals linkages between humans and natural resources through the analysis of values and perceptions for two groups. It is hoped that these results will provide management strategies to dive shop owners and tourism planners. The future of this tourism coastal zone depends on the continued research and the implementation of findings. The development of sustainable tourism programs in this region depends upon proper reef use and management demonstrated to visitors.

## CHAPTER 2.0: LITERATURE REVIEW

The purpose of this chapter was to review a variety of literature and combine and relate the findings to this study. The chapter is divided into three separate sections. The first section reveals literature related to Mexico's coastal tourism management and the coral reef ecosystem. The second section discusses common pool resources in coastal zones. The third section investigates values and perceptions and the final section is a summary that cohesively blends the literature with research objectives.

### **2.1 Mexican Coastal Tourism and the Coral Reef Ecosystem**

Tourism development in the Mexico region and travel to the Caribbean has rapidly increased over the past few decades. Brown, Tompkins & Adger (2002) claim, "tourism is the fastest growing sector of the global economy, accounting for US \$3.5 trillion in 1999" (p. 11). Between 15 and 16 million U.S. citizens visit Mexico each year and more than 385,000 reside there year round (U.S. Department of State, 2004). Since the inception of Cancún in 1975 there has been a steady and rapid influx in tourism to the Yucatán's coastal state of Quintana, Roo. Between 1980 and 1990 there was a 19.6% annual growth rate of tourists to the area; this threefold increase underscores the region's rapid rate of development (Cervantes, Borja & Sanchez, 1993). The Yucatán region and Cancún in particular, has become a tourist consumption space for mass amounts of visitors (Torres, 2002). In 2003, Jordán-Dahlgren & Rodríguez-Martínez explain that the coastal state of Quintana, Roo is a "successful resort area and is nowadays the main destination of tourists within Mexico, with almost 4 million visitors in 1997" (p. 151).

The influx of tourism to this region is placing an increased demand on the natural resources in the area, specifically the fragile and unique coral reef ecosystem. Torres & Momsen (2004) state that "tourism development has not only created demand for products by tourists, it has also stimulated rapid growth in local consumption attributable both to increasing disposable income for individual families and exploding population growth" (p. 303). The Quintana, Roo region relies on the reef to attract visitors and provide a range of marine based activities. Due to the increased growth in the region and demand on the resource, it is important for the region to realize the values of this resource when devising management plans. If the reef becomes degraded and less pristine, visitation will decrease.

Coral reefs are vulnerable and endangered ecosystems that are faced with multiple pressures and worldwide degradation. The Status of Coral Reefs of the World: 2004 states, "70% of the world's coral reefs are threatened or destroyed, 20% of those are damaged beyond repair, and within the Caribbean alone, many coral reefs have lost 80% of coral species" (Coral Reef Task Force, 2006). Research reveals that "most scientists believe reef degradation occurs in response to both natural and anthropogenic (human-caused) stresses" (National Oceanic and Atmospheric Administration, 2005). Coral reef ecosystems can be directly and indirectly affected through a variety of environmental and human pressures such as: climate change, natural disasters, catastrophic storms, over fishing, pollution, marine-based activities, trampling and the acts of buying or collecting reef species (Knowlton, 2001; Roupheal & Inglis, 2001; Gössling, 2002; Wilkinson, 2004). Unfortunately, it has been predicted that "24% of the world's reefs are under imminent risk of collapse through human pressures" (Wilkinson, 2004, p. 7).

It should be noted that there appears to be an increase in literature regarding the decline of corals and the multiple threats facing the ecosystem (Hatzioios, Hooten & Foder, 1998; Wilkinson, 1998; Hoegh-Guldberg, 1999; Hughes & Connell, 1999; Gardner, Côté, Gill, Grant, & Watkinson, 2003; Agardy, 2004; Buddemeier, Kleypas & Aronson, 2004; Wilkinson, 2004). This increase in research interest reveals strong concern among the scientific community and indicates that the shallow sea is a region of the world that has not received the amount of research and monitoring it deserves.

Coral reefs are invaluable sources of biodiversity and the resources provided by these ecosystems help sustain the livelihoods of many coastal community inhabitants (Wilkinson, 2004). Brown, Tompkins & Adger (2002) state that, "coastal zones are among the most highly productive, densely populated and valuable ecosystems on the earth" (p. 2). Globally, researchers are urging a thorough examination of existing management strategies toward marine resources. The world-wide decline of coral reefs and the increased human interaction with reefs proves that current monitoring and management practices should be assessed; efforts should be made for more proactive, inclusive and responsive practices (Bellwood, Hughes, Folke & Nystrom, 2004). The influx in visitation to the Quintana, Roo region is grounds for enhanced coastal management plans and sustainable tourism practices.

A range of activities and uses of natural resources occur in coastal tourism zones some of these include, recreation, fishing and residential living. There are different stakeholders involved in each activity which emphasizes the breadth and depth of viewpoints that can affect coastal management plans. The variety of activities and viewpoints underscore the need for effective resource management plans that incorporate

the various needs of the different stakeholders involved. Brown, Tompkins & Adger (2002) emphasize, "all natural resource management is an experiment from which we can learn about both the unpredictable nature of change in sensitive ecosystems, and about what works and what does not work in institutions" (p. 3). The challenge for coastal tourism planners is to balance the resource planning with the stakeholders involved. The key to developing successful coastal tourism is to create "harmonious relationships between the natural resources, environment and economic growth" (Wong, 1990, p. 220). It is important that coastal tourism planners strive to incorporate the various needs and viewpoints that surround the coral reef ecosystem in order to devise effective management strategies.

## **2.2 Common Pool Resources in Coastal Tourism Zones**

The coral reef ecosystem is commonly shared in coastal tourism destinations therefore, this section will outline the concept of common pool resources. In 1968, Garrett Hardin sought to spark action in the public when he published his treatise, *The Tragedy of the Commons*. In this document Hardin related human interaction with natural resources to an 18<sup>th</sup> century village where herdsmen are free to own limitless herds of cattle that graze in the common pastures. Hardin explained that the dramatic tragedy develops because "each man is locked into a system that compels him to increase his herd without limit – in a world that is limited" (p. 1244). The absence of rules, regulations and controls can lead to overuse leaving the resource in a state of peril. In short, common areas can become ruined due to humans pursuing their own economic interests and benefiting by extracting resources with no laws or limits.

Since Hardin's seminal work, the debate over the commons and natural resources has continued and literature regarding the issue has increased. Berkes (1989) explains that society suffers from an old habit that is hard to change which is the "consideration of natural resources as mere commodities to be exploited" (p. 19). The benefits humans and society receive from extracting wealth from resources are immediate and in the eyes of the beneficiaries, appear to outweigh the loss of resources. In short, shared resources are difficult to regulate due to the various user groups and their desires.

In tourism destinations, heightened monetary benefits give rise to unsustainable tourism practices toward common pool resources. Many natural resources that are utilized in tourism destinations, such as the coral reef ecosystem, are generally referred to as common pool resources. Examples of common pool resources include oceans, forests, air, and water resources all of which humans have access and rights to. These resources can be utilized by all individuals but are not owned by a single person or entity (Healy, 1994). The resources utilized by everyone reveal that boundaries and ownership issues can be hard to define which can lead to an increase in the concentration of users in an area and in turn can result in conflicts between user groups.

The tragedy that arises in coastal tourism zone commons centers on the fact that humans will continue to extract and want more out of the resource. Addressing the Caribbean in particular, Wilkinson & Buddimeier (1994) emphasize that "the small size of the Caribbean puts its coral reefs at particular risk from threat of expanding human populations and resource exploitation" (p. 72). The coral reef ecosystem is so fragile and this research has shown that unlimited access and use has detrimental effects in small coastal tourism communities. Briassoulis (2002) explains a grim picture of the collective

effect on the commons by specifically relating the effects of tourism on its surrounding environment:

"Water and air are indispensable inputs to human activities. Scenery is a central ingredient of the tourism product. Water bodies receive wastewater, the atmosphere is a sink of urban and industrial air pollutants, and open areas are waste bins of garbage" (p. 1069).

It is understood that tourism relies on natural resources (Holden, 2005) but the resources could be overused leading to a tragedy or demise of the tourism product (Briassoulis, 2002). There is a heightened level of awareness of the problem with the commons and capacity issues in coastal tourism zones. The concern stems from the continued increase in global travel and tourism and the exploitation of global natural resources (Butler, 1996; Gössling, Hansson, Hörstmeier & Saggel, 2002). Human behavior in tourism destinations and human interaction with natural resources in coastal zones are crucial pieces to understand when striving for proper coastal zone tourism management strategies. There is a need for protection and in some areas Marine Protection Area's (MPA's) have been established and are doing well. Biospheres like Sian Ka'an, just south of Akumal, are functioning as influential areas designed to preserve and protect species. This particular example demonstrates that compromises and policies can be effective if implemented and enforced appropriately.

### **2.3 Values and Perceptions**

Tourism flourishes in coastal zones. This is partially due to the appeal of sun, sea and sand; but destinations also offer beauty, aesthetic value, exotic appeal and diverse habitats (Daby, 2003; White & Rosales, 2003; Tabata, 1992). Nevertheless, the resources and amenities in a destination are viewed and utilized by different individuals and groups

in a variety of ways. Coastal stakeholders include, but are not limited to residents and extractive users, indirect users of goods and services, and visitors (Brown, Tompkins & Adger, 2002). This large group of stakeholders involved in coastal zones may not be aware of their potential impact on the resource or influence on management decisions. The following quote illustrates the various direct and indirect impacts on coastal resources:

"inland residents who own small aquariums; package tourists or independent travelers to coastal areas; people who eat fish or marine animal meals at restaurants worldwide; consumers of bath sponges, mother-of-pearl or black coral jewelry; and beachcombers who collect stones and shells all influence the demand for coastal resources" (Brown, Tompkins & Adger, 2002, p. 52).

Although stakeholders may be unaware of their influence on a resource, they do develop personal values and perceptions toward natural resources in a destination. These values and perceptions develop within individuals as a result of their particular connection to the resource and the region. Their bond or attachment is dependent upon how and why they use the resource. The bond builds within each stakeholder and is shaped by individual, social and cultural aspects. In short, "stakeholders may be perceived either as a threat to the success of a decision, or possible owners of the decision, or as co-managers of a resource" (Brown, Tompkins & Adger, 2002, p. 54). Understanding the bonds that attach stakeholders to the resource, managers can glean insight into why stakeholders' value particular resources thus leading to improved methods of resource management (Kyle, Mowen & Tarrant, 2004).

An individual's preferences develop through culture, upbringing, heritage, education, and physical surroundings (Tuan, 1974). These traits shape a person's comprehension of an area and lend insight into why perceptions and attitudes about a

place can differ. In this study values are defined as things or events that serve as a foundation that individuals use to achieve goals, wishes, demands and desires (Clark, 2002). Individual's values and perceptions develop and change over time. Morford and colleagues (2003) explain that "people's attitudes toward something can change as they receive (perceive) new information about it" (p. 14). As a result, a bond or connection can form between an individual and a place, area or environment. "Attachment involves an interplay of affect and emotions, knowledge and beliefs, and behaviors and actions in reference to a place" (Proshansky, Fabian & Kaminoff, 1983, p. 59). Affect, emotion, feeling, culture and social upbringing are all central to this concept. These attributes aid in bonding people to destinations and underscores the importance of recognizing them in management strategies.

Differences in values and perceptions stand as challenges in resource management and tourism planning and in some cases can lead to conflicts. An example of conflict over resource use and access is outlined by Bunce, Gustavson, Williams & Miller (1999) in their research about Montego Bay Marine Park, Jamaica. The authors discuss the challenges and conflicts that the Marine Park faces in balancing snorkeling, diving, party cruises and local fishermen. By observing visitor and local inhabitant interaction, Brown and colleagues (2002) have noted that "the social and cultural impacts of tourism can result in a rapid evolution of attitudes to visitors from receptive euphoria to overt hostility" (p. 11). Various perceptions and values can lead to conflicts over the same resource and local residents can grow to feel a sense of intrusion. Ultimately, Clark (2002) points out that natural resource professionals must understand "how not only natural systems but also human systems function - what motivates people's behavior,

what nature means to them, the different ways they value resources, and the multitude (and importance) of linkages with each other and our environment" (p. 31).

## **2.4 Summary of Literature**

The literature reviewed in this chapter reveals the challenges to coastal tourism planning as well as the importance of effective management of a destination. The alarming statistics and scientific discoveries about coral reefs emphasize the urgency of proper reef management and improved coastal tourism planning. Managing the reef, a common pool resource and increased visitation to the state of Quintana Roo are all critical pieces to consider in planning the future of this region. Increased growth in the region will place more of a demand on the region's resources, therefore understanding the values of the reef and the attitudes that stakeholders have toward the reef can lead to enhanced preservation and management practices of this particular resource.

The two different groups in this study individually and collectively have an impact in the region and on the coral reef ecosystem. Steele (1981) emphasizes that "collections of people influence settings in two main ways: by their numbers, and by group behavior" (p. 65). Visitation to Akumal, Quintana Roo, Mexico is seasonal and the town experiences an increase in the amount of visitors during the different seasons. The literature reveals that in order to devise effective management strategies it is crucial to understand the different views that visitors and local residents possess. The literature discussed in previous sections outlines that recognizing and incorporating a variety of viewpoints may lessen conflicts over the resource, balance the needs of the various groups and lead to improved reef protection.

## CHAPTER 3.0: METHODS

This chapter explains the various methods used in conducting this research. Data were collected in Akumal, Quintana Roo, Mexico from visitors and local residents during May 2005. Information was gathered from these two groups through questionnaires and personal interviews. The survey instrument was pilot tested in the U.S. before being administered to the visitors in Akumal, Mexico.

The location for this study was Akumal, Quintana Roo, Mexico (Figure 1), a coastal tourism destination 105 kilometers south of Cancún on the Yucatán Peninsula. Akumal is a village nestled in the Riviera Maya and serves as an ideal site for tourism research. The town is a former coconut plantation that has become a coastal tourism mecca due to its world-renowned dive



Figure 1. Location of the study area.

shops and easy access to the Mesoamerican Barrier Reef System (MBRS). This reef system extends from the tip of the Yucatán to Honduras and it stretches along the Akumal coast protecting the bay and creating a haven for marine life. The reef provides a superb context for marine-based recreation and is known as one of the premier dive locations in the Caribbean. Akumal Bay provides feeding and nesting habitat for a variety of marine turtles, including the loggerhead (*Caretta caretta*), the green (*Chelonia mydas*), and the hawksbill (*Eretmochelys imbricate*). In fact, the Mayan word *Akumal* means "Place of the Turtle."

### **3.1 Questionnaire Instrument for Visitors**

In this study, dive program participants were intercepted at the 3 dive shops; Akumal Dive Shop, Akumal Dive Center and Akumal Dive Adventures. The respondents were participating in marine-based activities that included diving, snorkeling and cruises. The participants ( $n=98$ ) were asked to complete a two part questionnaire (see Appendix) consisting of questions which were used to assess dive shop programs. The respondents rated the importance of 21 characteristics about their activity prior to their participation in the activity. At the end of their activity the respondents completed 20 questions that gleaned information on their demographics as well as their knowledge and perceptions of the coral reef. Included in this section was a question that related to the value that respondents assign to the coral reef ecosystem. Finally, the respondents rated the same 21 characteristics about their activity and related their answers to the performance of the dive shop.

### **3.2 Study Objectives Analyzed Through Reef Valuation**

In order to analyze the values and perceptions that the visitors have toward the MBRS, they were asked to indicate the importance of reef valuation statements. There were eight reef valuation statements which focused on protection, use and benefits associated with coral reefs. A Principal Components Factor Analysis was employed to examine the visitor responses to the eight reef valuation statements. This method was chosen because this research was aimed at analyzing common and unique inferences about coral reefs. A Principal Components Analysis (PCA) is the most common form of factor analysis. This analysis technique reports linear combinations of variables and thus

correlates groups of variables by extracting the maximum variance from the variables. The analysis illustrates the “variance and seeks a second linear combination which explains the maximum proportion of the remaining variance...PCA analyzes total common and unique variables.” (Garson, 2005). Therefore, this is the best available method to understand values and perceptions that surround the coral reef ecosystem. As such, this study employed the PCA method and hypothesized that coral reef statements would be described as factors and those factors would load together to reveal trends in visitor attitudes.

The respondents were asked to rate the coral reef valuation statements that related to the uses and benefits of coral reefs. The statements were presented as reasons for valuing a coral reef (e.g., use of coral reefs and the marine environment for recreation, preserving the reef for future generations, use of the coral reefs by local inhabitants) and there were three response options for each item: not at all important, somewhat important, and very important. A “no opinion” response option was also provided.

### **3.3 Importance-Performance Analysis of Dive Shop Programs**

An Importance-Performance Analysis (IPA) was the method employed for visitors who participated in a marine based-program or activity during their stay in Akumal. This is a method used for evaluating customers’ perceptions of the importance and performance of programs, businesses or products. Hudson, Hudson & Miller (2004) say that “IPA is a procedure that shows the relative importance of various attributes and the performance of the firm, product, or destination under study in providing these attributes” (p. 305). This method of data collection allows a researcher to aid a business

in gathering information about their clients which in turn, can assist managers in making future marketing decisions. In this study, visitors were asked to evaluate the importance and performance of programs offered through the three local dive shops.

Questionnaires were administered to program participants at the three dive shops. The research team coordinated with the three dive shop managers to identify potential interview times during the day. Each dive shop scheduled the different programs and had participants sign up for their activity in advance therefore, programs and times could be identified accordingly. In order to capture a random sample times, days, programs and respondents were chosen randomly. The surveys were completed in two phases. First, the respondents ( $n = 98$ ) evaluated the importance of 21 characteristics of a dive shop that could affect their decision to choose to participate in programs offered through the shop. Upon conclusion of the program (e.g., guided SCUBA dive, resort dive, snorkeling excursion, catamaran outing), participants evaluated the dive shop's performance on those same 21 characteristics.

The Importance-Performance Analysis was used to compare prior and post means for each dive shop characteristic. Consistent with other Importance-Performance studies, a five-point Likert scale was employed (Oh, 2001; Hudson, Hudson & Miller, 2004) and the importance and performance means were treated as coordinate pairs. The coordinate pairs were then plotted on a grid which was used to spatially illustrate the respondents' perceptions of dive shop characteristics. The central axes points were chosen based on the overall mean score of the x-coordinate pairs and the overall mean score of the y-coordinate pairs. Martilla and James' (1977) four quadrants were overlaid on the grid; "Keep Up the Good Work" (high importance, high performance), "Possible Overkill"

(low importance, high performance), “Low Priority” (low importance, low performance), and “Concentrate Here” (high importance, low performance).

### **3.4 Local Resident Interviews**

In this portion of the study local residents ( $n=21$ ) that lived and or worked in Akumal, Quintana Roo, Mexico were interviewed. The participants were individually interviewed and were asked four specific questions regarding the growth of tourism development and attitudes toward tourism in Akumal. The four questions were: (1) What events or occurrences have influenced the growth of tourism in Akumal? (2) Are there particular people that you associate with the growth or direction of the tourism industry in Akumal? (3) What is the current attitude of residents of Akumal toward tourists? (4) Have you seen this change over the years, for better or for worse?

The local residents interviewed in this study were selected according to where they worked, this criteria was set forth in order to have a diverse representation of the residents working in the tourism industry. The respondents included shop owners, hotel, library and restaurant staff. This group was also asked to report the length of time that they had worked in the town and some demographics. It is important to note that four dive shop owners, who live in Akumal, also participated in personal interviews. These interviews added background knowledge about the diving business to this study. Dive shop owners were asked seventeen questions regarding their business, the future of their shop, and characteristics about the programs they offer. At the end of the interview the owners were asked to answer the same four local inhabitant questions (noted above) therefore, they were added to the local inhabitant group for the analysis. The interviews

with the dive shop owners aided in understanding regional tourism development through the eyes of the shop owners.

The responses for the residents were gathered and coded using themes. The responses were written out and qualitative methods were employed to identify trends in the responses. Specific themes were revealed by observing words within the local resident responses that were associated with the tourism industry in the area. These themes included the growth and development of tourism, economic and employment benefits due to tourism, the reliance on the natural resource and movement of individuals into the town due to tourism. The objective was to reveal trends in responses that would assess the local residents overall perceptions of tourism in Akumal.

## CHAPTER 4.0: RESULTS

This chapter presents the results from the data collection and analysis. The chapter is divided into sections that coincide with the layout of previous chapters. In the first section demographical results about the two respondent groups are described. The second section outlines the results gathered from the visitors. The final section outlines the local resident responses.

### **4.1 Demographics**

There were 98 visitor responses included in the study and more than half of the respondents (66%) were male. The majority (87%) of the respondents resided in the U.S. and other countries of origin included Australia, Canada, England, Israel, Mexico and Switzerland. The visitors' age was reported in age range categories (Table 1) and the modal response (26.3%) was between 35 and 44 years.

There were 21 local residents who participated in the study and 71% of the respondents were male. The age of the local residents was also reported in age range categories (Table 1) and the modal response (42.9%) was between 25 and 34 years. The local residents were asked how long they had worked in Akumal and 61.9% responded that they had worked in the town 6 years or more. Interestingly, of the total local resident responses, 19% reported working in the town for more than 16 years.

Table 1. Demographic Results of Visitors and Local Residents in Akumal, Mexico

<b>Variable</b>	<b>Visitors</b>	<b>Local Residents</b>
<b>Gender</b>	<i>n=95</i>	<i>n=21</i>
Male	66%	71%
Female	34%	29%
<b>Age</b>	<i>n=95</i>	<i>n= 21</i>
between 18-24	16.8%	9.5%
between 25-34	21.1%	42.9%
between 35-44	26.3%	23.8%
between 45-54	23.2%	4.8%
between 55-64	10.5%	14.3%
between 65-74	2.1%	4.8%
75 or older	0.0%	0.0%
<b>Number of visits to Mexico</b>	<i>n=87</i>	<i>N/A</i>
Never	14.9%	
Once	21.8%	
2 - 4 times	22.9%	
5 or more times	40.2%	
<b>Years worked in town</b>	<i>N/A</i>	<i>n=21</i>
between 1 and 5 years		38.1%
between 6 and 10 years		28.6%
between 11 and 15		14.3%
between 16 and 20 years		9.5%
more than 21 years		9.5%
<b>Ethnicity/Country</b>	<i>n= 93</i>	<i>n=21</i>
Mexican		47.6%
Mayan Mexican		19.0%
Italian		9.5%
American/USA	87%	19.0%
British		4.8%
Other Country	13%	

#### 4.2 Visitor Results

When asked to report how many times respondents had visited Mexico, most reported that they had visited one or more times (Figure 2). A high percentage of repeat visitation was noted with 40% of respondents reporting that they had visited Mexico five or more times prior to their current trip. This apparent repeat visitation supports a heightened sense of attachment to the area.

**How many times have you visited Mexico prior to this trip?**

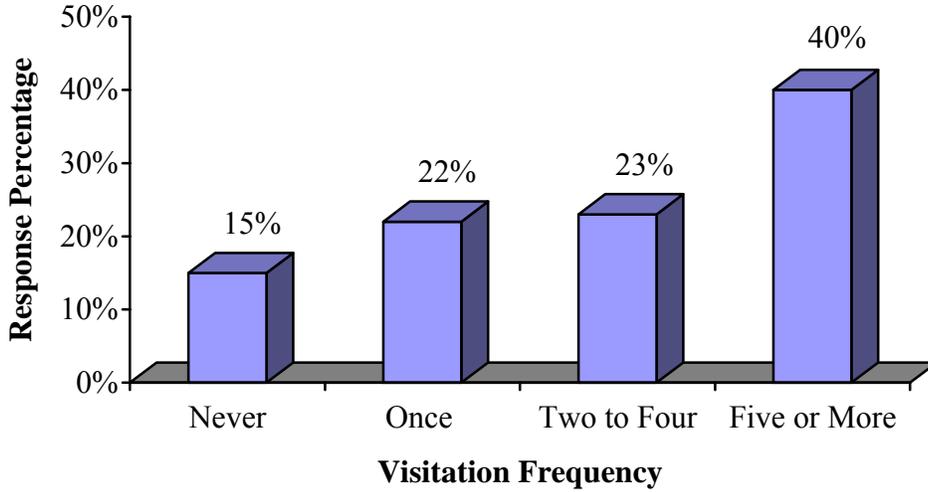


Figure 2. Visitors' Prior Visitation to Akumal, Mexico ( $n=87$ )

The visitors were asked to indicate their knowledge of the destination prior to their trip (Figure 3). Of the 95 respondents who responded, 36% reported that they had extensive knowledge about the destination and 27% reported that they had little knowledge about the destination. The visitors were also asked to report their knowledge about coral reefs (Figure 4). Of those who responded ( $n= 95$ ), 65% reported that they had some knowledge about coral reefs and only 7% reported that they had little knowledge about coral reefs. The visitors were asked to indicate if they had previous experience in a marine or coastal environment prior to their current trip to Akumal. Of the 92 respondents who answered, 73% reported that they had previous experience in a marine or coastal environment.

**How much knowledge did you have about this destination before taking this trip?**

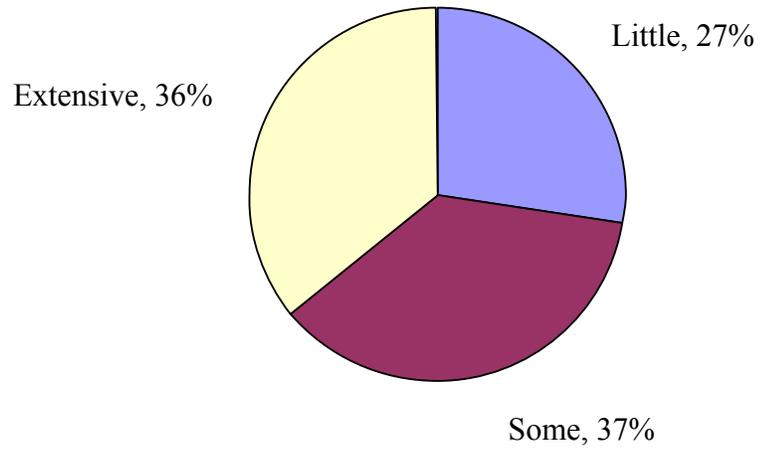


Figure 3. Visitors' Self-Reported Knowledge of Akumal, Mexico ( $n= 95$ )

**How much knowledge do you have about coral reefs?**

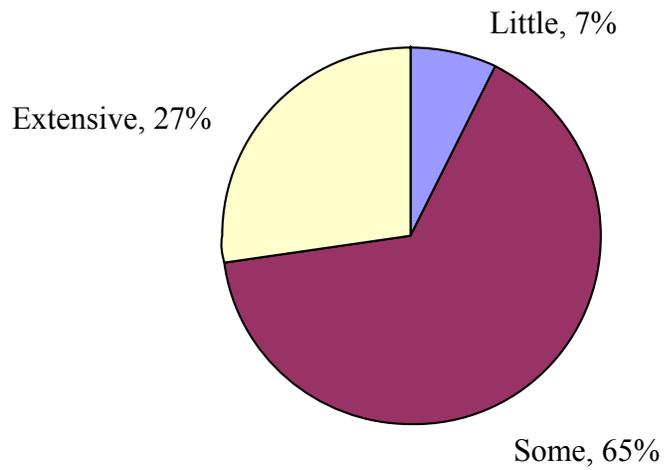


Figure 4. Visitors' Self-Reported Knowledge of Coral Reefs in Akumal, Mexico ( $n=95$ )

The Principal Components Analysis employed Varimax rotation to analyze the perceptions and values that the visitors had toward the Mesoamerican Barrier Reef System (MBRS). Responses to the eight statements regarding reef valuation were collected and evaluated (Table 2). The most influential information in the responses from the valuation questions reveal that 94% and 95% (respectfully) of the visitors indicated that protecting the coral reef and preserving the reef for future generations were very important to them. Interestingly, economic benefits related to recreation and tourism, use of coral reefs by local inhabitants and use of coral reefs & the marine environment for recreation all received higher percentages (8%, 5%, 5%) in the not all important category and lower percentages ( 52%, 56%, 66%) in the very important category.

The Principal Components Analysis (Table 3 & 4) revealed three factors: The first factor incorporated statements regarding preservation and was therefore renamed "Conservation". This factor explained 25% of the variance and had an eigenvalue of 1.982 after varimax rotation. The second factor contained statements that related to uses of the reef for educational purposes and was therefore renamed "Interpretive Resources." This factor revealed 20% of the variance and had an eigenvalue of 1.591 after varimax rotation. Finally, the third factor contained statements regarding economic, recreational and local uses of the reef and was therefore renamed "Economic Benefits." This factor revealed 20% of the variance and had an eigenvalue of 1.578 after varimax rotation. It is important to note that these factors do not rate the order of importance of the statements, the analysis is only used to correlate the responses gathered for each statement.

Table 2. Visitors' Ratings of Valuation Statements About Coral Reefs

<b>Reef Valuation Statements*</b>	<b>Total Responses (n)</b>	<b>Not at all Important (%)</b>	<b>Somewhat important (%)</b>	<b>Very Important (%)</b>	<b>No Opinion (%)</b>
Use of coral reefs & the marine environment for recreation	95	5	29	66	0
Protecting coral reefs	95	0	3	94	3
Economic benefits related to recreation and tourism	95	8	39	52	2
Fish and wildlife habitat	95	0	7	89	3
Preserving the reef for future generations	95	1	2	95	2
Use of coral reefs by local inhabitants	93	5	34	56	6
Use of the reef as a tool for environmental education	93	0	24	72	5
Knowing that other people may use and enjoy the reef	93	2	28	69	1

*\*statements are modified from, Armstrong, Y.D., (1995).*

Table 3. Rotated Component Matrix of Coral Reef Valuation Statements

Reef Valuation Statements	Factor Loadings (n= 82)			
	Mean Score (max= 3)	Factor 1 <i>Conservation</i>	Factor 2 <i>Interpretive Resources</i>	Factor 3 <i>Economic Benefits</i>
<b>Factor 1: Conservation</b>				
Protecting coral reefs	2.98	0.891	0.097	0.034
Preserving the reef for future generations	2.95	0.805	-0.097	-0.117
Fish and wildlife habitat	2.93	0.690	0.272	0.217
<b>Factor 2: Interpretive Resources</b>				
Use of the reef as a tool for environmental education	2.73	0.194	0.876	-0.082
Knowing that other people may use and enjoy the reef	2.65	-0.039	0.796	0.277
<b>Factor 3: Economic Benefits</b>				
Use of coral reefs and the marine environment for recreation	2.63	-0.001	0.091	0.752
Economic benefits related to recreation and tourism	2.50	-0.034	-0.075	0.669
Use of coral reefs by local inhabitants	2.56	-0.153	0.291	0.648

Table 4. Reef Valuation Factor Means and Percent of Variance Explained After Varimax Rotation

Factor	Overall Mean Score	Eigenvalue	% of Variance	Cumulative % of Variance
Conservation	2.949	1.982	24.772	24.772
Interpretive Resources	2.705	1.591	19.889	44.661
Economic Benefits	2.552	1.578	19.721	64.382

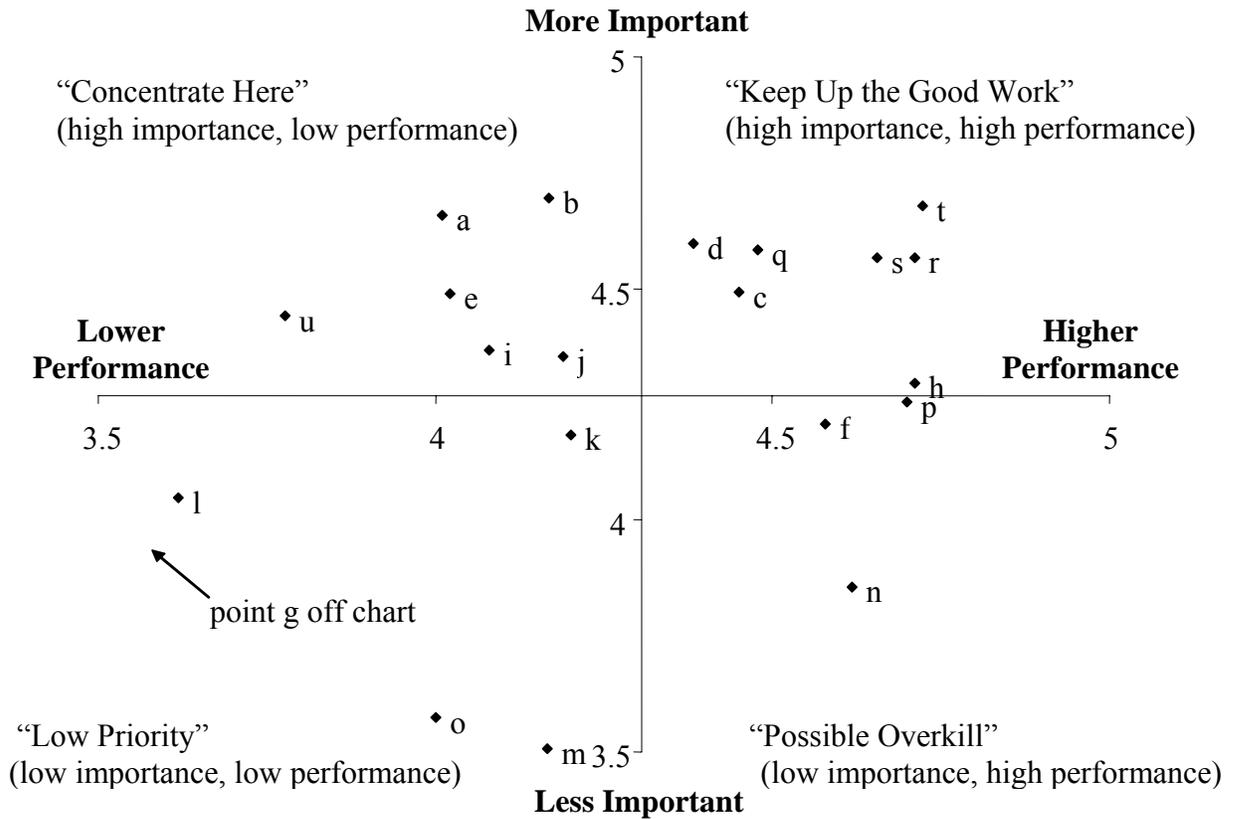
The results of the Importance-Performance Analysis (IPA) are provided in Table 5 and illustrated in Figure 5. Specifically, the mean scores are shown in Table 5 and then the coordinate mean pairs are plotted on the two dimensional grid in Figure 5. The grid uses the importance scores to form the vertical axis and the performance scores to form the horizontal axis. Martilla & James (1977) indicate that "positioning the vertical and horizontal axes on the grid is a matter of judgment" (p. 3). Depending on what the researcher or manager wants to evaluate the movement of the grid lines could lead to a variety of interpretations and provide different analyses. Oh (2001) recommends that the mean values of the importance and performance values be used for the crossing point when constructing an IPA grid. Therefore, for this study mean values of the importance (4.27) and performance (4.31) scores were used to form the mid point on the IPA grid.

The results of the IPA indicate that the dive shops are performing well but there are several programming and managerial areas that managers could improve. Seven of the 21 characteristics fell into the "Keep Up the Good Work" quadrant: reputation of the dive shop, accreditation of the dive shop, courteous, knowledgeable, professional, and certified guides and staff. Three characteristics fell into the "Possible Overkill" quadrant: condition of equipment, safety precautions and reef ecology and responsible use. Five characteristics fell into the "Low Priority" quadrant: variety of equipment, price of activity, variety of activities, environmental messages in activity and educational component in activity.

Six characteristics fell into the "Concentrate Here" (high importance, low performance) quadrant: location of dive shop, accessibility of dive shop, availability of equipment, length of dive, size of group, multilingual abilities of the guides and staff.

These results indicate that participants were not completely satisfied with their programs. This quadrant inferred that the dive shops could improve their performance by providing signage and a variety of equipment that is in proper working condition. It appears that clients would like to participate in smaller groups and experience longer dives. There was also an indication that the multilingual abilities of the shops' staff and guides would also improve the divers' experience.

**Importance-Performance Analysis (IPA) of Survey Item Mean Scores (n= 90)**



Facility

- a- Location of dive shop
- b- Accessibility of dive shop
- c- Reputation of dive shop
- d- Accreditation of dive shop

Equipment

- e- Availability of equipment
- f- Condition of equipment
- g- Variety of equipment
- h- Reliability of equipment

Programs

- i- Length of dive/activity
- j- Size of group
- k- Price of activity
- l- Variety of activities
- m- Environmental messages in activity
- n- Reef ecology and responsible use
- o- Educational component in activity
- p- Safety precautions

Guides/Staff

- q- Courteous
- r- Knowledgeable
- s- Professional
- t- Certified
- u- Multilingual

Figure 5. Visitors' Importance-Performance Mean Scores of Dive Shop Characteristics

Table 5. Visitors' Important-Performance Scores for Features of a Dive Shop

<b>Features of a Dive shop</b> ( <i>n</i> = 90)	<b>Importance</b>		<b>Performance</b>	
	Mean	Mode	Mean	Mode
<b><u>Facility</u></b>				
Location of the dive shop	4.66	5	4.01	4
Accessibility of dive shop	4.69	5	4.17	4
Reputation of dive shops	4.49	5	4.45	5
Accreditation of dive shop	4.60	5	4.38	5
<b><u>Equipment</u></b>				
Availability of equipment	4.49	5	4.02	5
Condition of equipment	4.21	5	4.58	5
Variety of equipment	4.03	5	3.43	3
Reliability of equipment	4.30	5	4.71	5
<b><u>Programs</u></b>				
Length of dive/activity	4.37	5	4.08	4
Size of group	4.35	5	4.19	5
Price of activity	4.18	5	4.20	5
Variety of activities	4.05	5	3.62	3
Environmental messages in activity	3.51	3	4.17	5
Reef ecology and responsible use	3.86	5	4.62	5
Educational component in activity	3.57	5	4.00	5
Safety precautions	4.26	5	4.70	5
<b><u>Guides/Staff</u></b>				
Courteous	4.58	5	4.48	5
Knowledgeable	4.57	5	4.71	5
Professional	4.57	5	4.66	5
Certified	4.68	5	4.72	5
Multilingual	4.44	5	3.78	3

### **4.3 Local Resident Results**

The majority of local residents encountered in Akumal are workers who attend to the visitors' needs. The local residents that were interviewed for this study were asked their ethnicity and the majority of respondents (67%) were Mexican and Mayan Mexican. The local inhabitant interviews revealed evidence that this group has a passion toward the natural resource (the reef) because increased tourism brings more jobs. When asked about tourism in Akumal one respondent said, "99% of people here have a job because of tourism." The re-occurring theme in the local responses was that tourism is bringing in a source of revenue and income for the residents and the community. When asked about tourism in the area another respondent said, "people visit because we have blue ocean and sky, good temperature and white sandy beach...if we don't have this, the town would be empty." These responses indicate that the locals understand why the visitors are coming to Akumal and they are aware of the potential economical impact that tourism can provide.

A sense of attachment toward the town and the reef was revealed among the respondents in this group during interviews. These individuals are employed in the town and their livelihood and sustenance depend on visitation to the region. However, there is a physical disconnect between visitors and local residents and this can be seen by the location of the hotels versus the location of local inhabitant homes. Most of the local residents live on the other side of the large highway and they cross over into the "tourist zone" each day for work.

There is a potential for resentment among this group due to the fact that it appears that the beach and the coral are set aside for the visitors' enjoyment. When asked about

the attitude of the residents in Akumal toward tourism one dive shop owner said, “at the end of the high season everyone is annoyed.” Catering to the visitors is their livelihood and local inhabitants are forced (or feel forced) to go to other stretches of beach to enjoy nature unencumbered by tourists or wait until the season subsides.

## CHAPTER 5.0: DISCUSSION

The overall purpose of this study was to examine values and perceptions that surround the unique coral reef resource in Akumal, Mexico. Investigation into the literature revealed that the fragile coral reef ecosystem is essential to coastal tourism destinations; however, it is becoming increasingly endangered. Understanding the different values and perceptions that surround this natural resource lends insight into developing positive coastal management plans that would influence the future of the coral reef ecosystem. In order to implement effective management techniques the dive shop managers, coastal tourism planners and local residents must collaborate their efforts and understand the different values and viewpoints held by each group. With increased visitation to this area in the future, it is apparent that these individuals must work as a team to devise long term management plans for Akumal and strive to create a balance between tourism activities and the use of the coral reef resource. This collaborative team must also work to enforce existing laws and create new policies regarding the management of the natural resources in Akumal. The specific objectives of this research sought to examine the visitors values and perceptions of coral reefs, identify characteristics of tourism programs that are important to the visitors and assess local resident perceptions of the tourism industry in Akumal.

In the results chapter, evidence of repeat visitation illustrates that visitors are drawn to Akumal, the reef and marine activities. However, this study reveals that there is a disconnect between the visitors desire for environmental messages in tourism activities and their participation in the activity. Visitors to this area indicate that they have some

knowledge about reef conservation and are interested in having conservation messages incorporated into their programs; however, the Importance-Performance Analysis (IPA) revealed that visitors are more concerned with seeing the reef and experiencing a positive dive. Visitors want to get onto the reef to experience it for themselves and they are concerned about proper equipment, group size and spending as much time on the reef as possible. In a sense the visitors' actions speak louder than words. The visitors say they are concerned about the reef but upon arrival to the destination, IPA results show that the visitors are more concerned with equipment and diving activities. An example that relates to this disconnect has also been revealed in the literature regarding individual's actions toward littering (e.g., Wagstaff & Wilson, 1988). Individual's words do not always reflect their actions. Additional comments written on the backs of the surveys indicated that visitors do feel a sense of urgency in seeing and experiencing the reef. Some even stated that they wanted to bring their children back to see the reef before it is gone. The visitors seem to value the reef but do not see their actions as a part of the problem or a solution to the inevitable.

The results reveal that Akumal dive shops should strive to enhance their conservation strategies and programs in three main areas. First, dive shop staff should demonstrate a strong environmental ethic and be more creative with their environmental messages to invoke a sense of action within the visitor. If the visitor can become part of the solution they will understand the need for the messages and will enjoy their experiences more. The dive masters must lead by example through proper interactions with the reef (e.g., not touching or standing on the reef). Akumal dive shops should offer reef education courses, such as the Professional Association of Diving Instructors (PADI)

Reef Identification and Reef Fish Identification which allow the visitor to take part in reef research. Visitors participating in these types of courses may feel more connected to the resource, leading to a heightened sense of conservation and global reef stewardship (e.g., Reef Watch, and Project Aware).

Second, the dive shops should emphasize the ecological and economic significance of the reef for the local population. The IPA revealed that the visitor placed a low importance rating on these items which indicates that there is a need for educating the visitor to increase their level of awareness. For example, dive masters should emphasize their reliance on the reef for their livelihood. If the reef becomes degraded, visitation and tourism-related employment will decrease. Third, dive shops should include conservation messages and provide training in their programs this would increase awareness within the visitors and could lead them to teach others. These messages should be reinforced and modeled at various stages in the program. For example, dive shops could create conservation pamphlets to accompany their program advertisement literature which would be given to visitors before they even decided to participate in an activity. All of these strategies will strengthen visitors' attachment to the reef and contribute to the sustainability of the resource on which the local tourism industry depends.

Although this research did not intend to analyze nor measure place attachment, the valuation investigation and interviews revealed that visitors as well as local residents developed an attachment to the area and to the reef. Attachment to a place is dependent on experiences and reactions in a destination and it can develop while an individual is exposed to natural resources in the destination. The first time visitor to a tourism

destination can be related to a child who experiences the beach or the woods for the first time (Altman & Low, 1992; Tuan, 1974). If experiences in the destination are positive, the individual becomes attached to the place and is filled with the desire to value the resource so that return visits can be made. Place attachment is "a positive bond that develops between groups of individuals and their environment...It explicitly contains emotional content" (Jorgensen & Stedman, 2001, p. 234). Visitors to Akumal appear to be attached to the destination and the reef due to the sport of diving and potential to participate in marine activities. Future research may include investigating if the visitor's development of place attachment has a relationship to the desire for environmental messages and conservation practices in marine-based programs such as SCUBA diving and snorkeling. Also, it would be fruitful to compare the differences or similarities between visitor and resident attachment levels.

Three study limitations were noted during the data collection. First, there were funding constraints which led to a short amount of time spent in Akumal. This resulted in a limited sample time. If more time could have been spent in Akumal then, a larger sample could have been achieved. Second, the study was conducted during the low visitation season. If this study was conducted again it could be fruitful to collect data during the height of the season not only to increase the sample size but also to compare the data from both seasons. Third, the environmental education center was closed therefore, activities offered by the center to the visitors and locals could not be assessed. During the height of the season the education center offers many programs to visitors and residents about environmental conservation and coastal ecology. It would have been advantageous to incorporate the center into the study to increase the sample size. It

would have also been interesting to compare the visitor and resident participants with each other and with dive shop respondents. The study findings will be shared with the three dive shops in order to disseminate our findings and recommendations. The findings will also be shared with the education center in case they would like to participate in similar research projects in the future.

## **5.1 Conclusions**

Akumal is an ideal location for tourism research and can be a useful site for future long-term research projects. In fact, Wilkinson & Buddemeier (1994) recommended that the Caribbean region “has the potential to serve as a model region for the development of regional resource management and research” (p. 72). It is evident that tourism is prospering in Akumal and tourism has been flourishing in the Yucatán region for several decades. Visitors are drawn to this coastal region because of the natural resources in the area. However, in order for tourism to be sustainable in Akumal and other small coastal communities, the natural resources must be protected and the issue of the commons must be addressed. In short, there is a delicate balance between the environment and the tourism industry, which depend on each another for survival.

Implications for future research include the need to address tourism development and best practices for tourism in coastal zones. Recent coral reef research is focused on gathering scientific data about the reef ecosystems but there has been limited data collection by social scientists other than economic studies. It is imperative that natural scientists work jointly with social scientists to effectively plan and manage coastal tourism zones. There is a need for long term studies that assess tourism development and

monitor impacts over an extended time period. Additionally, there is a need for baseline data to understand a destinations' carrying capacity and management strategies are needed to properly control common resource areas. In short, the Yucatán can serve as an ideal location for scientists to work together to understand the long term implications of tourism development in a coastal zone.

Current tourism activities in coastal areas must extract value (economic) from the resource but leave the resource intact. If the coral dies, the attractiveness of the area will decline and thus the tourism will shift drastically. At a recent ecotourism conference, world renowned oceanographer and marine biologist Dr. Sylvia Earle (2005) stated, "We must convey the importance of looking at the system as *living*—extract the value from the *living* animals." Following Earle's advice, the tourism industry in Akumal should turn to marketing the live product and adding value to the living resource that visitors are coming to see. This challenge calls for sustainable tourism strategies which control the way the commons are managed in tourism destinations as well as managing the impact visitors inflict on the destination's environment and natural resources.

Striking the proper balance between humans and nature should be the ultimate goal in proper planning strategies for tourism destinations. Jacques-Yves Cousteau (1971) pleaded for equilibrium between humankind and nature when he stated, "we will realize that the sea is but an immense extension of our human world, a province of our universe, a patrimony that we must protect if we ourselves are to survive" (p. 256). We must heed this advice on a global level and strive for improved tourism management strategies for coastal destinations such as Akumal.

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APPENDIX  
Survey Instrument

## Survey Instrument

North Carolina State University is conducting tourism research in the Riviera Maya. We are graduate students at North Carolina State University and we are asking for your participation in this research study. The purpose of this study is to identify characteristics of tourism programs and activities. Specifically, questions will focus on components of dive shops and associated marine activities.

### **Information**

If you agree to participate in this study, you will be asked to complete a brief survey before and after your activity/program.

### **Benefits**

The results will be utilized to assist the region in enhancing their programs for tourists.

### **Confidentiality**

The information collected in the study will be kept strictly confidential.

### **Participation**

Your participation in this study is voluntary; you may decline to participate in the study. If you decide to participate, you may withdraw from the study at any time.

### **CONSENT**

“I have read and understand the above information. I agree to participate in this study with the understanding that I may withdraw at any time.”

Thank you for your contribution to this study.

\_\_\_\_\_

*Please sign your name*

\_\_\_\_\_

*Date*

.....

*tear here*

### **Contact Information:**

If you have questions at any time about the study or the procedures, you may contact Tia Herring [cmherri2@ncsu.edu](mailto:cmherri2@ncsu.edu) or Holly Bosley [hebosley@ncsu.edu](mailto:hebosley@ncsu.edu).

## Visitors Participating in Activities at Dive Shops in the Riviera Maya, Mexico

### Importance Scale—Features of a Dive Shop

Listed below are various features of a dive shop. We would like to know how important the following features of a dive shop are to you. Please CIRCLE THE NUMBER which *best describes how important each item is to you when choosing a dive shop.*

	Not Important 1	2	Somewhat Important 3	4	Very Important 5
<hr/>					
<b><u>Facility</u></b>					
Location of dive shop	1	2	3	4	5
Accessibility of dive shop	1	2	3	4	5
Reputation of dive shop	1	2	3	4	5
Accreditation of dive shop	1	2	3	4	5
<b><u>Equipment</u></b>					
Availability of equipment	1	2	3	4	5
Condition of equipment	1	2	3	4	5
Variety of equipment	1	2	3	4	5
Reliability of equipment	1	2	3	4	5
<b><u>Programs</u></b>					
Length of dive/activity	1	2	3	4	5
Size of group	1	2	3	4	5
Price of activity	1	2	3	4	5
Variety of activities					
Environmental messages in activity	1	2	3	4	5
Reef ecology and responsible use	1	2	3	4	5
Educational component in activity	1	2	3	4	5
Safety precautions	1	2	3	4	5
<b><u>Guides/Staff</u></b>					
Courteous	1	2	3	4	5
Knowledgeable	1	2	3	4	5
Professional	1	2	3	4	5
Certified	1	2	3	4	5
Multilingual					

Please share any additional comments that you may have on the back of this sheet.

**THIS PAGE IS INTENTIONALLY LEFT BLANK**  
**PLEASE DO NOT GO ON TO THE NEXT SECTION**  
**WE WILL CONTINUE AFTER YOU PARTICIPATE IN YOUR ACTIVITY**

## Visitors Participating in Activities at Dive Shops in the Riviera Maya, Mexico

### Questions

1. How much knowledge did you have about this destination area before taking this trip?  
     Little                      Some                      Extensive
  
2. How many times have you visited Mexico prior to this trip?  
     Never              Once              Two-Four times              Five times or more
  
3. How much knowledge do you have about coral reefs?  
     Little                      Some                      Extensive
  
4. Have you had previous experience in a marine or coastal environment?  
     Yes    No  
     If yes, please explain what and where \_\_\_\_\_
  
5. People have different reasons for valuing coral reefs. For each of the following, please indicate with a check mark whether the statement is: not at all important, somewhat important, or very important *to you personally*?

	Not at all Important	Somewhat Important	Very Important	No Opinion
Use of coral reefs and the marine environment for recreation				
Protecting coral reefs				
Economic benefits related to recreation and tourism				
Fish and wildlife habitat				
Preserving the reef for future generations				
Use of coral reefs by local inhabitants				
Use of the reef as a tool for environmental education				
Knowing that other people may use and enjoy the reef				

6. In what town are you staying while you are in the area? \_\_\_\_\_
  
7. Where do you currently reside? \_\_\_\_\_  
     (US zip code *-or-* city, state, country of current residence)
  
8. What is your gender?  
      Male  
      Female
  
9. Which age group best represents your age?  
      18-24                       55-64  
      25-34                       65-74  
      35-44                       75 or older  
      45-54

## Visitors Participating in Activities at Dive Shops in the Riviera Maya, Mexico

### Performance Scale

Listed below are features of a dive shop. We would like to know how you feel now that you have visited this dive shop and participated in an activity. We would like to know how this dive shop is performing on each of the items. Please CIRCLE THE NUMBER which *best describes your feelings about how the dive shop performed on each of these items during your activity.*

	Poor Performance	2	Average Performance	4	Excellent Performance
	1	2	3	4	5
<hr/>					
<b><u>Facility</u></b>					
Location of dive shop	1	2	3	4	5
Accessibility of dive shop	1	2	3	4	5
Reputation of dive shop	1	2	3	4	5
Accreditation of dive shop	1	2	3	4	5
<b><u>Equipment</u></b>					
Availability of equipment	1	2	3	4	5
Condition of equipment	1	2	3	4	5
Variety of equipment	1	2	3	4	5
Reliability of equipment	1	2	3	4	5
<b><u>Programs</u></b>					
Length of dive/activity	1	2	3	4	5
Size of group	1	2	3	4	5
Price activity	1	2	3	4	5
Variety of activities	1	2	3	4	5
Environmental messages in activity	1	2	3	4	5
Reef ecology and responsible use	1	2	3	4	5
Educational component in activity	1	2	3	4	5
Safety precautions					
<b><u>Guides/Staff</u></b>					
Courteous	1	2	3	4	5
Knowledgeable	1	2	3	4	5
Professional	1	2	3	4	5
Certified	1	2	3	4	5
Multilingual					

Please share any additional comments that you may have on the back of this sheet.  
*Thank you for your participation!*