

CUBAN MARINE POLICY: A CASE OF CONTEXT

A THESIS SUBMITTED TO THE GRADUATE DIVISION OF THE UNIVERSITY OF  
HAWAII AT MANOA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE  
DEGREE OF

MASTERS OF ARTS

IN

GEOGRAPHY

DECEMBER 2016

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Keywords: Marine protected areas, Cuban environmental policy, Political Ecology,  
tourism

## Acknowledgements

I would like to thank my committee Alison Rieser, Mary Mostafanezhad, and Camilo Mora for their guidance and support from the development of my topic through the completion of my thesis. The encouragement to follow my passion and interests has made me a better student and taught me invaluable lessons outside of academia, which I will cherish always. Their mentorship is sincerely appreciated.

I would also like to thank my Cuban network of friends. My research would not have been possible without the help from Alberto, the extended family of Juan Karlos and Haydee, Yunai, and Virginia. To all of my interviewees, I cannot express my gratitude for the warmth, welcome, and open conversations that you shared with me. With each and every one of these conversations my respect and admiration for the Cuban people and culture grew.

For their support and encouragement, I would like to thank my family and friends. I would especially like to thank Brittany Sowers and Jan Vicente for accompanying me for the beginning of my field research, for being sounding boards, and for assisting me in my search for the case study location.

Finally, I would like to thank the Geography Department for all of the support I have received while completing my Masters. From the professors who classes challenged me, to my cohort and fellow graduate students who were constant sources of encouragement, support, and advice, the camaraderie between us is essential for emerging academics, and I am thankful for your friendship.

Abstract:

In this time of great change, Cuba's environment will be challenged as economic growth and an emerging tourism industry threaten to pull Cuba out of its time capsule. A case study of the people's perception of coastal livelihoods in the Villa Clara province, an archipelago experiencing rapid tourism development, illuminates the many environmental, social, and economic issues that are arising along much of Cuba's coastline. Focusing on perceptions of the Marine Protected Area (MPA) management method to conserve coral reefs and attitudes toward a state-run fishing cooperative, this case study shows how these methods of marine resource conservation, dating from different political eras in Cuba, interact. This case study also considers how the "lost Eden" discourse surrounding Cuba's coral reefs has shaped management implementation and how it is perceived locally, and whether these perceptions suggest future conflict between conservation and development in this region. Political changes in the 20<sup>th</sup> century have left Cuba a legacy of pristine coral reef ecosystems and a strong, domestic environmental policy framework. The Cuban State now seeks capital and foreign investment to expand employment and to grow the economy. As these dynamics change, Cuba has the opportunity to adapt to encroaching market demands for tourism development or develop new industries that will prioritize the maintenance of its natural resources.

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1 INTRODUCTION CHAPTER

2 Marine management is at the forefront of conservation because coral reef  
3 ecosystems' vulnerability continues to increase from climate change coupled with  
4 other anthropogenic factors including overfishing and pollution (Hughes et al.  
5 2003). The importance of coral reefs and their potential risk of decline, are of great  
6 concern to the millions of people who depend upon these resources for food  
7 security and livelihoods (Cinner et al. 2012). Coral reef ecosystems perform  
8 functions that are essential for many coastal areas and are biodiverse communities  
9 with much left to discover (Burke et al. 2011). However, without proper  
10 management, these reefs are at an even higher risk. Implementation of marine  
11 management is imperative in order to conserve these fundamental ocean  
12 ecosystems. The ability to manage marine ecosystems will only be effective when  
13 social aspects are coupled with the ecological (Cinner et al. 2009).

14 In order to conserve coral reef ecosystems, it is imperative that the approach  
15 strategy is conducive to the location (Agardy et al. 2003). A problem with much of  
16 the management of coral reef ecosystems is that the conservation regime follows a  
17 top-down approach with overarching national agencies and international entities  
18 (Wiegus et al. 2014). Just as species differ according to region, management  
19 technique needs to fit location, based on more than ecology alone. Community,  
20 economics, politics, and history of a place are key elements to consider when  
21 implementing marine management. The history of marine management changes  
22 from place to place in accordance with custom and culture. Cuba boasts a robust  
23 and resilient culture that has been evolving over the last two centuries and greatly

24 affects its environmental and natural resources (Gebelien 2011). Because of Cuba's  
25 political legacy and culture, it is critical to consider these factors when looking at the  
26 country's marine management regime in order to make conservation effective. For  
27 these reasons, the thesis will address how the discursive portrayal of healthy coral  
28 reefs affects Cuba's management, as well as how Cuban perspectives of changes in  
29 financial and social capital along the coastlines are affecting the reefs and fisheries  
30 resources. Using a political ecology lens will enable these issues' nuances and  
31 origins to come to light, offering great insight to how marine management is being  
32 conducted on the ground and whether this regime will be able to adequately  
33 conserve Cuba's natural resources during this time of new development.

34 This thesis will address the following questions:

35

36 What political and economic mechanisms have allowed for the marine resources to  
37 maintain their state of ecological health?

38

39 How does the rhetoric of Cuba's reefs as lost gardens of Eden affect international  
40 perceptions and influence national and local management regimes?

41

42 How will local perceptions of relationships to the environment affect compliance  
43 with management regimes and the new tourism industry?

44

45 To answer these questions I employed a political ecology framework,  
46 considering historical context and political legacy as well as understanding the

47 ecology of the region in my case study to see how marine management functions on  
48 the ground. Political ecology takes an interdisciplinary approach to environmental  
49 issues which include ecology, politics, culture, history, and economics on local,  
50 regional, state, and international levels (Stonich 1998). This framework is useful for  
51 understanding local management regimes because it puts the resource, the people  
52 who use the resource, and their power relations into context at many different  
53 levels and enables many interacting factors to be understood holistically (Blaikie  
54 and Brookefield 1987, Peet and Watts 1993).

55         The origins of the environmental law in Cuba arose from the extensive  
56 destruction that some industries, particularly sugar, reaped on the environment in  
57 Cuba (Diaz-Briquets and Perez-Lopez 2000). Sugar was introduced as a cash crop  
58 on the island around 1590 and its production did not take a substantial fall until the  
59 late 1980s when the Soviet Union collapsed (Gebelien 2011). At its peak prior to  
60 1989, 7.4 million tons of sugar was grown and processed in country (Diaz-Briquets  
61 and Perez-Lopez 2000). To plant and process this granulated gold, millions of  
62 hectares of land were deforested (Gebelien 2011). Along with the deforestation,  
63 came soil erosion, river, wetland, and ocean pollution from the discharge of the  
64 industrial sugar plants (Gonzalez 2003). Similar pollution came from other  
65 industries such as mining and oil, however sugar had the largest impact because of  
66 the vast deforestation of the island (Gonzalez 2003). When the Soviet Union  
67 collapsed in 1989, Cuba went through an era called the Special Period (Whittle et al.  
68 2002). When Fidel Castro took power in 1959 and changed the political regime to  
69 communism, cutting all economic ties with the US, the Soviet Union became Cuba's

70 main trading partner (Whittle and Lindeman 2004). It was a very dependent  
71 relationship, leaving Cuba vulnerable because of their reliance on the Soviet Union  
72 for petroleum imports. With the Soviet Union's collapse, the lack of petroleum  
73 imports caused the farming economy as well as many others to breakdown, thus  
74 Cuba embraced organic farming in order to feed its people (Whittle and Lindeman  
75 2004).

76 Before the Special Period, in the late 1970's and 80's, Cuban scientists and  
77 outsiders like consultants from the UN Food and Agriculture Organization (FAO),  
78 recommended establishing national parks and other kinds of protected areas, both  
79 terrestrial and marine (Gebelien 2011). These ideas were well-received but did not  
80 have a large effect until the Castro regime made them a priority following the Earth  
81 Summit in Rio 1992 (Gebelien 2011).

82 Environmental law in Cuba before the Soviet collapse was based upon Law  
83 33, which only vaguely defined environmental threats and regulatory norms nor  
84 have penalties or consequences for violations (Evenson 2010, Houck 2000).  
85 Termed the Law on Environmental Protection and the Rational Use of Natural  
86 Resources (Evenson 2010), Law 33 addressed pollution issues without setting limits  
87 for waste discharges nor even defining what constituted waste (Evenson 2010).  
88 The collapse of the Soviet bloc led to environmental law reform (Estrada-Estrada  
89 2004).

90 The first workshop for the establishment of protected areas occurred in 1989  
91 when SNAP (Sistema Nacional de Areas Protegidas) was defined (Evenson 2010).  
92 More improvements followed in 1995 during the second National Protected Areas



93 Workshop where marine areas became its own subdivision SAMP (Subsistema de  
94 Areas Marinas Protegidas) and then came to the forefront in the subsequent  
95 workshop in 1998 at which there were 535 marine area proposals (Evenson 2010,  
96 Estrada- Estrada 2004). This time also saw the establishment of Law 81 in 1997,  
97 which improved Law 33 by calling for an integrated, terrestrial-marine system  
98 (Evenson 2010). Protected areas were specifically defined as “enshrined to protect  
99 and maintain biodiversity and natural resources, socially and culturally associated,  
100 to achieve the specific objectives of conservation” (Law 81 art. 8, 1997).

101 An important feature of Law 81 is its clarification of who has authority for  
102 governance. It contains a 3-tier system in which CITMA (Ministry of Science,  
103 Technology, and the Environment) is the lead agency (Evenson 2010). Prior to  
104 CITMA’s creation in 1994, the law allowed any agency relevant to the proposed  
105 development project to apply it, causing conflicts of interest among many  
106 government agencies (Evenson 2010). CITMA allowed for the consolidation of  
107 review of regulations, eliminating the conflict of transparency: Law 81 is the first  
108 tier, the National Assembly is the second, and the CITMA is the final. Within CITMA,  
109 there is the Centro Nacional de Areas Proteginas (CNAP), which is responsible for  
110 the operation of the SNAP and SAMP protected area networks (Evenson 2010,  
111 Houck 2000). Language in Article 27 of under Law 81 of the Constitution makes the  
112 sustainable development goals of the Earth Summit the law of Cuba (Cruz et al.  
113 2008).

114 Once Law 81 was in place, new environmental laws began to follow with the  
115 ideology of a more holistic ecosystem approach (Evenson 2010). The SNAP

116 program became law with Law Decree 201, which demanded documentation of  
117 protected areas as well as specified categories of protected areas: Protected Areas of  
118 National Significance, Protected Areas of Local Significance, and Special Regions of  
119 Sustainable Development in 1999(Cruz et al. 2008). There are also standard  
120 restrictions in all federal MPAs in Cuba such as the prohibition of mining (Cruz et al.  
121 2008).

122 Law 212 is the Coastal System Management law that identifies the coastal  
123 zone and requires multiple-ecosystem integration (Whittle and Lindeman 2004).  
124 Decree Law 212 created strict regulations for coastal development such as  
125 prohibiting permanent structures in the coastal zone and the zone of protection,  
126 which includes 20-40 meters inland from the coastal zone (Cruz et al. 2008). In this  
127 area only light agriculture and non-permanent structures are allowed (Cruz et al.  
128 2008). In the past decade a new SNAP plan was proposed from 2003-2008,  
129 influenced by the United Nations Development Program (UNDP) and the American  
130 NGO, the Environmental Defense Fund, focusing on pollution prevention and  
131 reduction, demarcation of SAMP areas, and reestablishment of habitats (Evenson  
132 2010). It also implemented extended gap analysis that validated SAMP and regional  
133 planning for the design and implementation of MPAs (Evenson 2010). This new  
134 proposal has led to 108 potential MPA sites throughout the country (Evenson 2010).  
135 The amount of progressive legislation is positive, but its flaws in the marine context  
136 are in mechanics and enforcement. The history of Cuban environmental policy  
137 follows a top down, national agency- and international entity-centered model.  
138 While many scientists and international NGOs propose MPA locations, the common

139 citizen and resource user is not asked to contribute until after the proposal is  
140 approved. The issue arises, why MPAs? MPAs are a tool for marine management  
141 used globally (Mora et al. 2006). However, they are both contested and praised.  
142 MPAs are ineffective biologically if enforcement is lacking; marine resource users do  
143 not abide by restrictions for a variety of reasons and differing incentives for  
144 noncompliance (McClanahan et al. 2016, Edgar et al. 2014).

145         In the wider Caribbean, Cuba is now famous for having large marine  
146 protected areas such as Gardens of the Queen in the south, which boasts Goliath  
147 groupers, several species and large numbers of sharks, and very healthy groves of  
148 endangered Elkhorn and Staghorn corals (Fernandez et al. 2011, Griffin 2012). At  
149 the end of 2015, the US and Cuba signed a memorandum of understanding which  
150 essentially is an agreement to exchange management techniques and cooperate in  
151 managing marine areas because of the close proximity of the two countries and the  
152 interconnectedness of the marine life (MOU 2015). The MPAs designated for this  
153 project were the Flower Garden Banks in the US and Guanahacabibes National Park  
154 in Cuba (MOU 2015). By overlooking the lack of compliance and enforcement in the  
155 MPAs designated for this exchange and cooperation, both countries seem to endorse  
156 if not perpetuate the “paper parks” critique. Therefore, the establishments of the  
157 MPAs, which have become the regime of choice in Cuba, are potentially creating  
158 more harm than protection because of the changing relationship with the US.

159         Another compounding factor for coastal ecosystems health is the tourism  
160 industry, which is experiencing a boom from the newly thawed relations with the  
161 US. Cuba, an island nation known for its alluring antiquity and crystal blue

162 coastlines, is emerging as a destination with tremendous potential for new tourism  
163 development. Tourism has taken over from sugar as the industry to potentially  
164 bring Cuba's economy into the international market. The past decade has been a  
165 period of immense growth for the tourism industry, Cuba having one of the highest  
166 growth rates for tourism in the Caribbean (CTO 2006). In 2015 alone,  
167 approximately 1.7 million tourists visited from January to May making it the second  
168 most visited Caribbean destination with a 15.2% increase of tourists from the  
169 previous year (CTO 2015).

170         The question of how Cuba will handle this mass influx arises. Will regulation  
171 of coastal development slacken? Because this surge of tourism development  
172 occurred over only the past decade, and continues at unprecedented rates, with the  
173 addition of the US clientele, the infrastructure is lacking. While the Ministry of  
174 Tourism has identified eight distinct regions for tourism development, the portals  
175 for arrival, in-country transportation, and water, sanitation, and electricity services  
176 are not accustomed to the amount of people streaming in from abroad (Miller et al.  
177 2008). This lack of preparedness is even more concerning because a majority of the  
178 targeted destinations are coastal environments, especially those portrayed as "lost"  
179 gardens of Eden. Coastlines in Cuba are being targeted for development because of  
180 their beauty and intact natural resources. The intersection of increasing tourism  
181 and marine protection is challenging Cuban environmental law and how it will  
182 sustain environmental standards with new development in key areas. As with most  
183 countries that have new development and pristine resources, discourse will  
184 influence how both development and conservation evolve in Cuba.

185           In the past few years, Cuba has been referred to as an Eden of coral reefs  
186 (Griffin 2012, Pennisi 2015, PBS 2010). Because there has been limited foreign  
187 research there and many coastlines are undeveloped, some reefs are relics of what  
188 most of the Caribbean used to look like. They have not experienced the same level  
189 of coral disease outbreaks and coral-to-algal phase shifts as the rest of the Caribbean  
190 (Hughes 1994). Cuba is not without heavily degraded areas, but there are many  
191 remote regions of the island that have many components of coral reef ecosystems  
192 that many other islands in the Caribbean have lost, like apex predators (Whittle and  
193 Lindeman 2004, Griffin 2012).

194           The Eden rhetoric however, is problematic because it insinuates that these  
195 areas are undiscovered and unused by humans. It ignores that there is a large  
196 amount of national research, that there are coastal communities that rely on these  
197 resources, and infers that outside entities have the responsibility to and are justified  
198 in imposing their research and management philosophies upon these locations. It  
199 brings back an imperialistic tone, that Cuba needs saving or helping to conserve  
200 their resources and that can be dangerous.

201           The narrative of Eden, in fact, has resulted in the MPA philosophy, despite its  
202 drawbacks, overwhelming Cuba's marine management. The model of MPAs comes  
203 from the west and is performed in many states in the global south via large  
204 environmental NGOs. It is a static solution that in theory is ideal but in practice on  
205 the ground, with lack of enforcement can cause more problems as in some of the  
206 regions in Cuba. As aforementioned, Cuba maintains an integrated coastal  
207 management system that protected ecosystems holistically from wetland or

208 mangroves out to the ocean (Whittle and Lindeman 2004). It prohibits building  
209 within 40 meters of the coast and therefore was effective and protecting large areas  
210 of ecosystems (Houck 2000). By relying on an MPA regime instead of this  
211 integrated management, the coastal land appears to be developable. This is  
212 problematic when enforcement is lacking because it leaves a gap in the  
213 conservation: an MPA that is essentially a paper park can be found right next to a  
214 new all-inclusive hotel resort.

215         The tourism industry and the MPA as conservation regime are both top down  
216 mechanisms that leave little autonomy for the local stakeholders. Upon examination,  
217 the hotels and MPAs popping up on many of the pristine beaches of Cuba have  
218 semblances to corporate colonialism and structural adjustment. The tourism  
219 industry is being built upon foreign investment that monopolizes each swath of  
220 beach (Whittle et al. 2003). Chains such as Iberostar and Melia, both Spanish  
221 conglomerates, have their hotels in Cuba's main beach hotspots such as Veradero,  
222 Cayo Coco and Guillermo, and Guardalavaca. These companies, among others,  
223 essentially have small colonies in the all-inclusive resorts that they create on the  
224 beaches of Cuba, which is bringing Cuba into the international economy. Marine  
225 protected areas have a similar outcome in that they are bringing in foreign entities,  
226 frequently non-governmental and non-profit in nature. The structure of the MPA  
227 strategy brings in western, aka democratic and neoliberal, ideology along with it.  
228 The MPA requires enforcement and compliance to be successful, but in Cuba,  
229 enforcement resources in most locations are not adequate. Individual compliance,  
230 which is a worldwide issue, is a main concern. This factor is difficult to measure

231 because many of the resource users are fishermen who have a strong respect and  
232 relationship with their environment, but they also respect their government and  
233 local community. Because the fishermen do not have a role in the establishment of  
234 the MPA, their compliance is not assured, especially because many of the MPAs have  
235 different regulations and often these regulations are not made clear.

236 All of these issues with overlapping interests for coastal land use are made  
237 even more difficult because of climate change and already present vulnerability. For  
238 example, in an extensive GIS study of Cuba's land and natural resources, two maps  
239 delineate spatially areas where coastal development threatens to degrade the  
240 environment: the first shows Areas Threatened by Development (fig. 5.7) and the  
241 second, Areas Threatened by Sediment Deposition (fig. 5.8) (Gebelien 2011). The  
242 first map elucidates "the coastal areas reefs...[as] the targeted threat area" because  
243 of the high threat level forms a ring around a majority of Cuba's coastline due to the  
244 combination of population with sewage discharge, urban runoff, tourism  
245 development, and construction projects (Gebelien 2011). Similarly, the second map  
246 illustrates the "anthropogenic impacts on the Cuban environment... which clearly  
247 demonstrates the potential for sediment transport from inland areas out to the  
248 coastal zones, mangrove areas, and other sensitive habitats" (Gebelien 2011). These  
249 two maps suggest there is scientific support for the present vulnerability of the reefs  
250 and coastal areas.

251 In Cuba, an overlooked but significant factor are the fishing cooperatives in  
252 the state of its coral reefs, a means by which fishermen have gained knowledge  
253 essential to the conservation of the marine resources they harvest. The political

254 regime is a large reason behind this, however the political climate is changing  
255 rapidly and this is cause for concern for Cuba’s marine resources. The study area of  
256 the Villa Clara province is a unique location to study the interactions of marine  
257 management and development. The younger generations of local fishermen are  
258 going back to the cayos of their parents and grandparents, however, it is not for  
259 fishing but for employment in the tourism industry. The province also has the MPAs  
260 and managers, local citizens who run individual tourism businesses, and large  
261 hotels. It is an ideal place to see change happening in real-time including both the  
262 effects on the local people as well as the environment.

263 Cuba has a great opportunity to create a new path of development because  
264 its national natural resources are such anomalies in this region. However, with the  
265 beginnings of bilateral agreements with the US, protecting the marine environment  
266 is a common goal for the two neighbors, and its relationship is projected to grow  
267 into other sectors. How Cuba reacts and adjusts to the US and its economic benefit  
268 will greatly impact the physical environment of not only Cuba, but also political and  
269 economic arena of the Caribbean and Latin America.

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395 CHAPTER 1

396

397 Uncharted Waters: the Political Ecology of Apocalyptic Tourism and Conservation in

398 Cuba

399

400

401 **Abstract:** As its relationship with the U.S. thaws, Cuba, an island nation known for  
402 its alluring antiquity and crystal blue coastlines, has emerged as a destination with  
403 tremendous potential for rapid tourism development. While these efforts promise  
404 to bring much needed foreign investment into the country, the construction of large  
405 all-inclusive resorts to accommodate the tourism influx is already reshaping its  
406 threatened coastal environment. Drawing on ethnographic research along the  
407 Jardines del Rey archipelago, this article examines how the emerging tourism  
408 economy is affecting the coastal and outer islet ecosystems as well as the fishery  
409 economy and way of life for the fishing town of Caibarien. A discourse analysis of  
410 the contradictions of development and conservation as well as progress and  
411 patriotism, are explored through the perspectives of local fishermen. Through the  
412 theoretical framework of political ecology, I investigate how discourses of the  
413 Anthropocene reveal rearticulated relationships between locals and their  
414 environment in the context of rapid tourism development in Cuba. This article  
415 contributes to emerging research on how, amidst unprecedented economic and  
416 environmental change, Cuban fidelity continues to run deep in the hearts and minds  
417 of its people, and questions the extent to which this identity will be able to

418 contribute to the conservation of its coastal ecosystems and shifting economic  
419 regime of capitalism.

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441 **Introduction**

442 “We’ve been waiting for you, we’ve been waiting for you for fifty seven years”  
443 cheered the man who was luring us into his refuge of a restaurant for an afternoon  
444 mojito to hide from the hot Havana sun in late September. It was our first day in  
445 Havana before we took the Viazul bus to the port of Batabano to catch the ferry to  
446 Isla de Juventud, our next destination in search of a pilot study site. It was a muggy  
447 day and lethargy hung in the air, infused with the aroma of fried plantains lofting  
448 out of the windows of Havana’s crumbling edifices. As we made our way back to our  
449 room in the casa particular, the Cuban version of a homestay, it was evident that the  
450 Pope, Papa Francisco, had recently departed as the souvenir shops lining the narrow  
451 streets of Habana Vieja displayed the leftover shirts printed with his face alongside  
452 the iconic Che ones.

453         Less than a year after this initial visit, US-Cuban political relations underwent  
454 significant shifts in the Caribbean state’s capital. A key aspect of this shift includes  
455 loosening sanctions, which allow Americans to legally visit the island country for the  
456 first time in over half a century. The opening of Cuba has led to a mass influx of  
457 tourists from the U.S. and around the world to travel to the idealized locale before,  
458 as is commonly suggested, it is “ruined” (CTO 2015). The rhetoric surrounding  
459 Cuba’s antiquity serves the tourism objectives of wanting to experience a unique,  
460 individual, and ‘authentic’ cultural exchange, that has developed over the past  
461 decade.

462         The apocalyptic narrative of experiencing the authentic Cuba was mentioned  
463 by almost all of the tourists we encountered, especially when it was discovered that



464 they were speaking with Americans, although without articulating what constituted  
465 a “ruined” Cuba. These narratives of Cuba as a place lost in time waiting to be  
466 discovered have strong imperialist tones, which keep Cuba in its seemingly never-  
467 ending cycle of control.

468           Before the Revolution in 1959, Cuba was the playground of the Caribbean. It  
469 boasted casinos along the coast, a thriving nightlife in the colonial capital of Havana,  
470 and countless beaches to soak up the sun (Whittle et al. 2002). It was the dream  
471 destination for travelers looking for a tropical escape, and the convenience of being  
472 a mere 90 miles from Miami made it that much more appealing to Americans  
473 (Whittle et al. 2002). As the economy and wealth rose, so did corruption and  
474 disparity among Cubans.

475           This discontinuity between the majority of the working class population and  
476 upper class led to political upheaval and revolution. Since then there has been a  
477 mixture of successes and failures in the Cuban state. The loss of access to the  
478 American economy and the capitalist market crippled the economy, then, after the  
479 Soviet Union fell in the late 1980s, Cuba lost its main trading partner, which led to a  
480 span of the 1990s deemed the ‘Special Period’, when the economy and subsistence  
481 of the country almost completely collapsed (Whittle and Lindeman 2004). From  
482 that point forward, the national strategy for economic growth has slowly shifted  
483 from a majority export crop of sugar to international tourism.

484           Tourism has been the leading industry for revenue since 1996 (Crespo and  
485 Negron Diaz 1997). The past decade has witnessed a period of immense growth for  
486 the tourism industry, Cuba having one of the highest growth rates for tourism in the

487 Caribbean (CTO 2006). In 2015 alone, approximately 1.7 million tourists visited  
488 from January to May making it the second most visited Caribbean destination with a  
489 15.2% increase of tourists from the previous year (CTO 2015). As Office of Foreign  
490 Relations (OFAC) regulations slacken and popularity grows, due in part to publicity  
491 such as the visit of U.S. President Obama and a free *Rolling Stones* concert, the  
492 question of how Cuba will handle this mass influx arises (U.S. Department of the  
493 Treasury 2016).

494         Because this surge of tourists occurred over the past decade, and continues  
495 at unprecedented rates, with the addition of the U.S. clientele, the infrastructure is  
496 lacking. While the Ministry of Tourism has identified eight distinct regions for  
497 tourism development, the portals for arrival, in-country transportation, and water,  
498 sanitation, and electricity services are not accustomed to the numbers of tourists  
499 streaming in from abroad (Miller et al. 2008). This unpreparedness is even more  
500 concerning because a majority of the targeted destinations are coastal  
501 environments.

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### 503 **Conservation Concerns in Cuba**

504

505         The Caribbean is known for its white sand beaches and coral reef  
506 ecosystems. It is also known for its decline in coral reefs and fisheries because of  
507 overexploitation caused by tourism development and climate change (Mumby et al.  
508 2007). In the 1970's and 80's there were massive outbreaks of coral disease in the  
509 Caribbean that decimated specific reef building coral species (*Acropora* spp.)

510 (Santavy et al. 2001). The reefs never fully recovered because at that time  
511 infrastructure was being built in order to accommodate tourism needs, which  
512 destroyed reefs through pollution of the bays (Hughes 1994).

513         Discovery Reef in Jamaica is an infamous example of this destruction and the  
514 showcasing the ecosystem phase shift from coral to algal dominated reef (Bellwood  
515 et al. 2004). There are many contributing factors to these phase shifts including  
516 overfishing of herbivorous species of fish, however tourism expansion via coastal  
517 development has had devastating affects (Bellwood et al. 2004). Currently the  
518 world's reefs are experiencing alarming rates of bleaching corals as water  
519 temperatures and degree heating weeks increase (Mora et al. 2016). As climate  
520 change worsens, these issues will only occur more frequently and intensely.

521         A coral reef ecosystem not only depends upon its own functioning for  
522 survival, but also needs mangrove and seagrass ecosystems for larval and juvenile  
523 nurseries and recruitment (Serafy et al. 2011). These complementary ecosystems  
524 are essential for coral reef survival in the Caribbean and have been destroyed  
525 oftentimes because of tourism development along the coast (Scott et al. 2012). But  
526 mangroves block the coastline from access and views, and seagrass beds muddy  
527 near shore waters, rendering them uninviting to most tourists in search of white  
528 sand and shallow, turquoise blue waters to swim in. The solution to these problems  
529 is almost invariably to destroy these ecosystems in order to achieve the perfect  
530 beach destination or clear the view for a golf course.

531         To combat this problem, in 2000 Cuba enacted Integrated Coastal Zone  
532 Management through Decree-Law 212, which prohibits building within 40 meters of

533 the sand (Whittle and Lindeman 2004). Its goal was to preserve all coastal and  
534 marine ecosystems from wetland to pelagic along the coastlines in specific areas  
535 (Cruz et al. 2008). Decree-Law 212 created strict regulations for coastal  
536 development such as prohibiting permanent structures in the coastal zone and the  
537 zone of protection, which includes 20-40 meters inland from the coastal zone (Cruz  
538 et al. 2008). In this area only light agriculture and non-permanent structures are  
539 allowed (Cruz et al. 2008). This legislation has not been tested, however, because  
540 until approximately 2015, Cuba has not been accessible to the market forces that  
541 elsewhere has driven the destruction of coastal ecosystems as a majority of the  
542 islands in this region have. Thus, the issue of how well Cuba's environmental law  
543 and policy will stand in this new age of tourism is at hand.

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#### 545 **Tourism in the Anthropocene**

546 Tourism in the Anthropocene is intrinsically linked to the question of what  
547 constitutes environmental sustainability. The destructive manner in which tourism  
548 first developed negatively impacted social and ecological systems throughout the  
549 world. Tourism undoubtedly had an impact on the environment but there are  
550 questions regarding when the effects began to change ecosystem services and  
551 functioning, which particular organisms or ecosystems are affected, and what level  
552 of disruption is accepted as natural. As Moore articulates "humans have been so  
553 influential so as to necessitate a change of epochal categorization in the life history  
554 of the planet" (Moore 2016). Herein lies the problem; the use and therefore debate  
555 of the definition of the Anthropocene turns negative impacts that are scientifically

556 objective, into subjective ones based on social, economic, and strongly political  
557 factors, especially in places like Cuba. By categorizing this era, in which humans  
558 have caused significant changes in the physicality of the land and ocean, exploited  
559 its living and nonliving resources, causing the extinction of various species and  
560 inducing global climate change, as the Anthropocene, the notion of humans and their  
561 impacts being part of the natural landscape and inherently natural to ecosystems is  
562 being questioned. Should the argument for humans being part of the landscape be  
563 based on population size or consumption rate rather than mere existence?  
564 Examining tourism through the Anthropocene lens, wherein the human species has  
565 an epoch based on their impacts, is compelling. Tourism is thought of as a modern,  
566 anthropogenic activity, facilitated by technology, while a bird or whale migrating is  
567 seen as a life history function. Is the amount of destruction a species imparts on the  
568 environment the factor to determine if they either become a part of the natural  
569 landscape or are excluded from it?

570         When examining tourism, the level of impacts led to the enactment of laws  
571 and regulations to rectify these impacts. However, Cuban environmental law was  
572 ratified when the tourism industry was not its focus, but as a way to mitigate the  
573 deforestation and pollution caused by the sugar industry (Gerhartz-Abraham et al.  
574 2016). With tourism as the replacement for the sugar industry, it is essential to  
575 avoid repeating history. Tourism is Cuba's lifeline and continues to expand, the  
576 more the government's relationship with the US improves. Cuba is also being  
577 pursued for tourism and scientific research because of its anomalous environmental  
578 jewels, specifically those below the rising sea surface, the coral reefs. Cuba's

579 environmental resources have given Cuba a legacy as the crown jewel of the  
580 Caribbean, the last Eden (Pennisi 2015).

581         These labels are prestigious but they can be questioned as misleading. There  
582 are many degraded areas, and the those not degraded may have survived because  
583 the country was not open to the capitalist market and did not have the capital to  
584 invest and develop its coastlines, like many of its other contemporaries in the region  
585 (Whittle et al. 2004). While Cuba's waters boast many species and intact fisheries  
586 that were thought to be regionally extinct, with tourism booming, will Cuba be able  
587 to keep its socialist mantras of environmental progressivism, or will its  
588 environments follow the footsteps of its close neighbors such as Haiti and the  
589 Dominican Republic?

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### 591 **Apocalyptic Tourism and Neoliberalism**

592         The Eden rhetoric for natural resources and antiquity for the cultural  
593 aspects of Cuba, places a market value on natural and cultural capital. The use of the  
594 narrative of Eden and antiquity of cities like Havana also creates a sense of  
595 immediacy and rush to experience a location. This rush breeds the notion that the  
596 locale will change the more people experience it.

597         The problem with these narratives is often times their assumptions are  
598 wrong. Some elements may be correct, for example, reef health does have an  
599 inverse relationship with number of people in the area. But the notion of Cuban  
600 culture as not evolving, and that outside entities are entitled to project preferences  
601 of change, is a common mistake (Cinner et al. 2009). In an op-ed piece, Cuban-

602 American journalist Natalie Morales exposes the harm that the apocalyptic cultural  
603 tourism narrative spreads by turning the narrative on its head:

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605       What do you think will ruin Cuba? Running water? Available food?  
606       Freedom of speech? Uncontrolled media and Internet? Access to  
607       proper healthcare? You want to go to Cuba before the buildings get  
608       repaired? Before people can actually live off their wages? Or before  
609       the communist regime is someday overthrown? Make sure you hurry  
610       and go observe these human beings in the time bubble that was  
611       created especially for you... (Morales 2016)

612 These questions directly highlight the issues behind the alluring architecture of  
613 Havana with Cuban fervor. These questions humanize the people who live in the  
614 country and their daily struggles, instead of treating them as props in backdrops of  
615 photographs (Morales 2016).

616       A similar phenomenon occurs surrounding Cuba's marine resources  
617 because of the pristine state of many of the reefs. However, when these narratives  
618 are found in scientific research, marine management and ecotourism industry treat  
619 these ecosystems as places that lack a population that has the ability to fully  
620 appreciate, study, or conserve them adequately. Both of these apocalyptic  
621 narratives allow a neoliberal economy access because of it returns Cuba into a  
622 frontier to discover and commodifies experience and ecosystems for the global  
623 market.

624 Commodifying natural and social capital places a market value on them and  
625 positions “markets as the ultimate tool for achieving optimal use and allocation of  
626 scarce resources” (Mansfield 2004). The apocalyptic and antiquity narratives make  
627 the cultural experiences and reefs ‘scarce resources’ by inciting the component of  
628 time. By placing a ticking clock on Cuba’s cultural and natural assets, a demand is  
629 created and a free market follows.

630 This article aims to explore how a region whose tourism economy is in its  
631 infancy will develop given these narratives, and how those dependent upon the  
632 environment perceive these narratives and are affected by them. It achieves this by  
633 using a political ecology lens to examine a case study in a coastal area in the Villa  
634 Clara province. By gaining insight from differing local perspectives in regard to  
635 relationships between the environment and government, tourism emerges as a  
636 mechanism both challenging traditional values and bringing new opportunities to  
637 many communities.

638

### 639 **Methods**

640 The main methods for this article were participant observation and  
641 interviews, to elucidate how fishermen relate to their environment and livelihood  
642 and how this affects their perspective on the new tourism industry in the region,  
643 including whether tourism is changing the physical environment and the cultural  
644 aspects of coastal Cuban lives. This article is based on five casual and 10 semi-  
645 structured interviews with retired and active fishermen who were members of the  
646 Caibarien fishing cooperative (Cresswell et al. 2003). The interviews were



647 conducted in Spanish at a household of a research collaborator. There were 20-30  
648 set questions, however, because of the casual nature of the interviews, which turned  
649 into conversations, the questions were answered organically. Fishermen expanded  
650 on historical experiences to qualify many of the questions about physical and  
651 biological change in fisheries stocks and the condition of the coastal environment  
652 and ecosystems.

653 In order to approach this study with a political ecology lens, questions  
654 ranged from the ecological to historical to socio-economic. Given the political  
655 history between the U.S. and Cuba, tact and sensitivity was required at all times.  
656 The social capital and closeness of community at my study site enabled me to find a  
657 key informant and then use snowball sampling in order to locate local stakeholders  
658 and fishermen to interview. My host family had a friend, who became my key  
659 informant and had worked with the fishery cooperative for twenty years and knew  
660 most of the fishermen in the town, Caibarien. All of the interviews were conducted  
661 at her house, on her outside patio in the afternoon. She assisted in organizing many  
662 of the interviews and aided as a translator if there was a miscommunication. The  
663 interviews were digitally recorded, transcribed, and then translated. A native  
664 Spanish speaker checked the translations and transcriptions. While all of the  
665 fishermen were willing to give their full names, in order to provide privacy,  
666 pseudonyms replaced real names.

667 Living with a Cuban family in their home, a typical *casa particular*, where  
668 they rent out rooms to tourists, I interacted with them, their tourism business, and  
669 other international guests which led to other observations and insights, that were

670 taken down as field notes daily. Theoretical application to this case study and  
671 analysis of perspectives are based upon my researcher bias and experiences both  
672 discussed with other stakeholders and seen in the field. Between the two times in  
673 the field duration time in country was two months.

674         The study site was chosen because it contained three of the main structures  
675 important to understanding how livelihoods and government's marine management  
676 strategies may change with increasing influx of tourists: a fishing cooperative, a  
677 marine protected area (MPA), and new tourism development. The fishing village,  
678 Caibarien, is in the Villa Clara province, about a five-hour bus ride plus a two-hour  
679 taxi ride from Havana. It can also be accessed by a two-hour bus ride from the Santa  
680 Clara airport. The fishing town itself is small, however has great access to the cays,  
681 also known as cayos, which is the draw for many tourists. There are a few *casa*  
682 *particulares*, essentially locals' houses with rooms for rent, in Caibarien, which  
683 provide a cheaper alternative to the crop of all-inclusive hotels that were built over  
684 the past ten years.

685         Caibarien is a town on the coastline across from an archipelago that is part of  
686 Jardines del Rey. The main cayos in this area are Cayo Las Brujas, Cayo Ensenachos,  
687 and the final accessible island, Cayo Santa Maria. Cayo Santa Maria is a protected  
688 Flora and Fauna Refuge that has an MPA off its shores and a protected beach that  
689 is accessible to visitors for a small fee. There is also a proposed additional MPA  
690 close to the detached Cayo Fragoso in the archipelago. There are 13 new hotels that  
691 have been built in the last decade with a concentration in the past five years on  
692 these cayos with more rooms underway. To access these offshore islets, a causeway

693 called a *pedraplen* was built from 1998-2000. It is essentially a rock and cement  
694 path through the shallow lagoon between the mainland and the islands; it is 48km  
695 long with bridges approximately every kilometer and a two-lane paved highway.  
696 The intersection of these three factors was an ideal for observing how the tourism  
697 industry is evolving and how it is affecting the locals, the environment, and the  
698 environmental policy of Cuba. I reached this site after exploring other sites around  
699 the country on a previous pilot study in 2015.

700

## 701 **Results**

### 702 *Cuban Fidelity and the Fishing Cooperative*

703

704 When sitting down with fishermen, the *patria* is palpable; their country, their  
705 people, their government, and their Fidel. He is the one who changed the lives for  
706 these fishermen in a way that they could not dream of when growing up on the  
707 fringing cayos of the Jardines del Rey archipelago.

708         The cayos off the coast of Caibarien are a stunning string of white sand  
709 islands that are part of the exaggerated shallow insular shelf that makes Cuba an  
710 ideal habitat for lobster fishing. Located on the coast closest to the cayos, Caibarien  
711 is a small fishing town that was built up by the Castro regime in the early 1960s for  
712 the fishermen and families inhabiting the cayos. Under former President Bautista,  
713 fishermen and their families lived and died on the cayos or in their small wooden  
714 fishing boats, with little access to health care, education, or even a constant food  
715 source.

716           None of my interviewees failed to mention that the revolution transformed  
717 the lives of all fishermen. Their personal experiences of how the fishing  
718 cooperatives in particular transformed their lives is fundamental to understanding  
719 the perspective of the fishermen towards their livelihood and tourism. When asked  
720 about how the cooperatives have changed his life, Tony, a retired fisherman, replied:

721

722           I was not able to write and read and I had to learn. They made me learn  
723 to write and read. During the evening they would teach me. In each  
724 cooperative they made a guide for each fish species. Any problems they  
725 had gone through the cooperative and they worked with people to fix any  
726 problems the fishermen had. The quality of life was great after the  
727 Revolution. They have houses, food, etc. because of the Revolution. The  
728 first thing the Revolution did for us was to make houses. I am now old. I  
729 am 78 years old and I saw all this and I saw them build my house.

730

731

732 Robert, another fishermen having experienced the same upbringing, explained:

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734           Because of the poor status of fishermen in Cuba the government after the  
735 Revolution created the fishing cooperatives. This is why all of the fishing  
736 villages are called *cuidades pesqueras* (fishermen cities). One hundred and  
737 eighteen houses were built and given to the fishermen for free. The  
738 apartments were also constructed. Fishermen had to pay very little for

739           these houses. Houses came with sofas, beds, stoves. I went from living in  
740           a house of palm trees to a fully furnished house.

741

742   The emphasis on how the government was the benefactor is present in all of the  
743   language that the fishermen use. For example, Ray, an experienced *langostero*  
744   (lobster fisherman) expresses his patriotism by providing a stark contrast of  
745   fishermen life before and after the revolution:

746

747           Before it was private fisheries. Families would live in boats. Most of the  
748           families would live in boats. We were limited. Very little food. Health  
749           was poor. The contractor always had us poor. After socialism the boat of  
750           the contractors was given to my dad as a gift of the many years of abusive  
751           labor from the capitalist movement...the people were protected after the  
752           Revolution.

753

754   The building of houses changed the lives of the fishermen in more than just material  
755   ways. In Angel's statement, the importance of the cooperatives is illustrated:

756

757           The best benefits from the cooperative were one hundred percent  
758           benefits. They gave us everything. They pay us what we are worth now  
759           but before it was a problem...we are a very united group of people.  
760           Fishermen are very united.

761

762 After asking what were the greatest benefits of the cooperative, this response is  
763 striking because it articulates the underlying motivation behind the fishermen.  
764 Through the cooperative they were given worth and protection. They became  
765 united through these cooperatives and were offered a collective voice, so that they  
766 wouldn't be taken advantage of in the future.

767 Understanding the history of the town and the life history of the fishermen in  
768 the region is essential to understanding perspectives on tourism and conservation  
769 in the area. The political history of Cuba affected different groups of people in  
770 individual ways, which is often generalized and assumes all Cubans reacted  
771 collectively. From location to generation, gender, and ethnicity, the Cuban  
772 perspective is dynamic and in constant change in the current political climate.

773

#### 774 *Conservation and Compliance*

775

776 One of the biggest problems worldwide with fisheries, whether they are  
777 offshore tuna fleets, or local citizens on a Sunday afternoon, is compliance with laws  
778 and regulations (Sumalia et al. 2006). The compounding issues of knowledge of  
779 regulations, compliance, and enforcement are the hurdles that fisheries worldwide  
780 face (Sutinen et al. 1990). In 2009, the Cuban government reorganized its  
781 regulatory body by eliminating the Ministry of Fisheries and combining its  
782 regulatory and research entities into the Ministry of the Food Industry (MINAL)  
783 (Wieglus et al. 2014). This change of management indicates the government's  
784 renewed interest in fisheries as an economic force for Cuba.

785 Fishing is not only a livelihood, but also a way of life for many of the  
786 fishermen of Caibarien. They are legacies in a long line of fishermen along the  
787 Cuban coast. Therefore with new legislation, one's personal history take precedence  
788 over new laws, even if the fisherman recognizes for the need to conserve fisheries  
789 stocks. The generational gap between fishermen is illustrated from a comment  
790 Robert made:

791

792 Older fishermen would teach the younger fishermen how to locate  
793 sites with landmarks. The new fishermen are more educated but we  
794 didn't need a title to find a good catch.

795

796 Robert's remarks demonstrate how the technology has affected the relationship the  
797 fishermen have with their environment. The younger generation has had the  
798 opportunity to receive an education from a young age, embracing technological  
799 advances that contribute to more industrialized fishing practices, however they lack  
800 the intrinsic knowledge and familiarity that comes from being on the water  
801 everyday since infancy. Yet, the fishermen claim to respect the laws and regulations  
802 because they know it is for the greater good and will provide food security for future  
803 generations. Tony remembered:

804

805 We have always been aware [of the restrictions] but now it is even  
806 stricter and we all respect it... back in the days we talked about MPAs

807 but it wasn't that much of a big deal. Now it is different. It is a big deal  
808 now.

809

810 The fishermen's reasons for compliance is mediated by their knowledge that these  
811 steps are necessary to maintain reproduction rates for fish in this time of climate  
812 change. But compliance is also mediated by knowledge that the state has taken care  
813 of the fishermen and their fisheries, and therefore they should follow the law  
814 because this entity has given them their livelihood. Tony defends his country's  
815 motives with: "Cuba has always been responsible with its resources. Cuba supports  
816 the reproduction of fish." Andros echoes how the Cuban state has taken care of the  
817 fishermen by adding "I sell it to the Cuban state because they gave me a boat, they  
818 gave me food, they give me everything and when I fish for them they pay me for it."

819 What is not mentioned is the defiance and resistance of these laws. There is  
820 a thriving informal market for fish, and it is supplied by both legal cooperative  
821 fishermen and fishermen, who are not in the cooperative and are therefore  
822 prohibited from fishing in this location. The resistance from the fishermen to break  
823 the laws however is fueled by the social capital in the communities and local people  
824 who want to buy fish but cannot afford the state's prices. Therefore with their acts  
825 of resistance, the fishermen are actually perpetuating the revolutionary values that  
826 changed their lives, while also contradicting this by becoming a private producer.

827

828 *Tourism Development and Climate Change Perspectives*



829           The tourism industry that has developed along the Jardines del Rey  
830 archipelago has the potential to employ much of the surrounding communities and  
831 bring in amounts of capital that the region has never seen before. However, with  
832 these benefits come environmental tradeoffs like pollution and habitat destruction.  
833 The building of new hotels has also led to invasive infrastructure and the disregard  
834 for Decree-Law 212 law. There are cayos further to the southeast in this section of  
835 the archipelago called Cayo Coco and Cayo Guillermo, some of the increasingly  
836 popular cayos for sun seekers (Winson 2006). These cayos are connected by a  
837 causeway that intersects the bay or lagoon area between the mainland and the  
838 islands. This infrastructure causeway has blocked the circulation of the bay,  
839 increased its salinity, and is greatly affecting the ecosystems, particularly the black  
840 mangroves (Cepero and Lawrence 2006).

841           The builders of the *pedraplen*, the causeway that connects the mainland to  
842 the study site cayos, avoided the effects from the parallel causeway by adding  
843 bridges roughly every kilometer. The *pedraplen* is 48km long and connects the  
844 mainland and the islands until the final one, Cayo Santa Maria. When asked how the  
845 *pedraplen* affects the fisheries and mangrove ecosystem, Angel responded:

846

847           Everything remains normal. There has not been a negative effect on the  
848 lobster fisheries... no because the construction of hotels is on land and  
849 not on the water so there is no problem. The *pedraplen* that was built is  
850 actually a benefit for us because all of the lobster juveniles live inside

851           these rocks close to the pedraplen. These rocks are a refuge for the  
852           lobster and for the smaller fishes.

853

854   Andros believes that “there is no problem with the pedraplen. They have done all of  
855   the construction on dry land and water circulation remains the same.” Robert  
856   referred to the improvement in this causeway as the reason for the lack of concern  
857   for the pedraplen:

858

859           There are 48 bridges that were built so that the circulation of the water  
860           would not be affected and to prevent die offs. The pedraplen runs only  
861           around shallow parts of the bay so that there weren’t too many rocks  
862           used for its construction. There is a lot of circulation. There shouldn’t  
863           be any environmental impact. Hotels were constructed on solid terrain  
864           where there is no fishing. Climate change could be having an impact but  
865           tourism does not have an impact.

866

867   Many of the fishermen cite climate change as the larger potential threat to the  
868   environment and fisheries over tourism. Robert claims climate change has caused  
869   the decrease in size of lobster:

870           Lobster sizes have decreased throughout the years. This has started  
871           changing for a long time now. It has to do with the changing climate.

872           We used to have episodes of a lot of wind in the evenings and now we

873 don't have these winds. This has caused the fishing industry to  
874 decrease a little.

875

876 Andros and Tony agree, blaming warmer water for their lobster fisheries' decline.

877 Andros says "warmer waters are causing the fisheries to go under. Climate change  
878 is the problem." Tony reiterates in agreement that:

879

880 The biggest threat to fisheries is climate change... now that the water is  
881 warmer it is less productive to catch fish now... with time things change.

882 Throughout the years it is different. But it is because of the climate  
883 changing not tourism.

884

885 Mike who like most of the fishermen did not see the problem with tourism, but did  
886 state "yeah but there are no regulations [for tourism]". The clearest explanation of  
887 the evolution of the older fishermen's lives, which shows the local perspective of  
888 how the tourism industry could be another mechanism to change lives for the  
889 younger generation of local Cubans is summed up by Robert:

890

891 I didn't need to go to school because I could pay the bills off with fishing.

892 Young fishermen are eager to fish. Government took measures to make  
893 sure that young fishermen could read and write. They graduated with

894 type writing degrees. And a lot of students graduate from marine

895 biology. 50 years ago to say you were a fisherman you were nothing,

896 nothing, poor, uneducated, etc. But to say you are a fisherman today you  
897 are a lot wealthier. It is not shameful. Now fishermen know about  
898 marine biology and are so educated. So fishermen are being employed  
899 by the tourism industry because this is big work force that is bringing in  
900 a lot of money. There are a lot of job offers from tourism. So a lot of old  
901 fishermen stayed fishing and those that were young and had the  
902 opportunity to be educated left to look for better jobs in the tourism  
903 industry. They had more of a future in the tourist industry.

904

## 905 **Discussion**

906

907 The case study illustrates the nuances of the struggle between new industry  
908 and environment. The interviews, in particular, consistent with the political  
909 ecology lens show that by examining the construction of knowledge, perspective,  
910 and narratives of issues, the forces that are affecting this coastal region are clear.  
911 Just as tourism is growing, so is environmental conservation interest in Cuba.

912 Cuba is known for boasting pristine ecosystems especially their coral reef  
913 ecosystems, such as the Jardines de la Reina Marine Protected Area, which has both  
914 scientists and conservation groups like international NGOs wanting to conduct  
915 research and start conservation programs in country. Finding the balance between  
916 the two will be the same struggle that island nations before Cuba have experienced.  
917 Since the tourism industry began in the Caribbean, the many island nations have  
918 allowed for development to ruin their natural resources only to start ecosystem

919 management and research decades later, once the ecosystems are, in many cases,  
920 destroyed. Understanding the Cuban fishermen perspective provides great insight  
921 because it shows how much of the older generation views new development.

922

923

924 *Changing Capitals*

925           Fishermen in the 1960s were given opportunity from the Revolution in the  
926 form of fishing cooperatives. The new hotel industry has the potential to be the job  
927 security for the generation that is just starting to join the workforce. The benefits of  
928 tourism for the local community range from employment in the hotels, to  
929 ecotourism activities like scuba diving and chartered fishing tours, and brings new  
930 opportunity that have never been available before, that allow Cubans to diversify  
931 their economies and make higher incomes. As Mostafanezhad et al. argue  
932 “neoliberal ideology extends into individual behavior where it is assumed that the  
933 individual perseverance and self-development lead to economic success”  
934 (Mostafanezhad et al. 2016). In the current Cuba, the idea of being an entrepreneur  
935 is not a possibility for the majority of the populace. Most of the businesses are  
936 highly regulated by the state as to ensure the socialist ideology. With the flow of  
937 new capital from international markets, the economic regime is beginning to change  
938 as well.

939           Some of the problems with the new industry that are not illustrated by the  
940 interviews are the loss of social and natural capital. While the economy of Cuba has  
941 not developed by capitalist market standards, the social infrastructure is one of the

942 most striking attributes of Cuba. When conducting interviews, I was able to meet  
943 more fishermen because they found out I was in town and wanted to talk to me  
944 about their lives. The reason I was able to find my study site was through  
945 connections from my taxi driver in Havana, who continued to check up on me  
946 throughout my stay. Cuban culture is about connection, as expressed in one of the  
947 interviews, fishermen “are a very united group of people”. This unity comes from  
948 the daily struggle and camaraderie of life in Cuba. The people of Caibarien are “the  
949 sets of elements, processes, and relations that shaped [their] lives at this time and  
950 place, and the political challenges that arise from that location” (Li 2014).

951         With emerging tourism industries, the links of social capital are breaking  
952 because the younger generation are not only away from home, whether it is a  
953 commute or relocation closer to work, but also because they are being exposed to  
954 technology, material goods, and cultures that are either censored heavily by the  
955 government or previously inaccessible. These changes hint at a “conception of  
956 structural determination in which structures mechanically cause things to happen,”  
957 without the subjects consciously being aware of the changes because they are  
958 integrated into a system, in this case, employment at a hotel (Peet and Hartwick  
959 2015).

960         With a large percentage of the younger generation pursuing employment in  
961 the tourism industry, Cuban culture is rapidly changing from influences that most  
962 Cubans were never exposed to. The emerging “capitalist regime” has the potential  
963 to “undermine the reproduction of socially valued forms of identity; by destroying  
964 existing cultural practices...” hotels and other “development projects [could] destroy

965 elements necessary for cultural affirmation”(Escobar 1995). In the case of  
966 Caibarien, younger fishermen leaving the cooperative for employment as boat  
967 captains for tours and scuba diving operations will change the culture of the town.  
968 It could also change the relationship that the community has with its environment.

969

970

971 *Knowledge and Resistance*

972 Cuban fishermen have a strong connection with the ocean and the fish it  
973 provides. The life of a fishermen is laborious, the elements are harsh, and its wear  
974 can be seen on the sun damaged faces of all of the men who I interviewed. However,  
975 they all have pride in what they do and how well they understand and know their  
976 environment. With tourism taking youth away from this lifestyle, and with  
977 increasing technology, the familiarity with the coral reef, mangrove, and pelagic  
978 ecosystems is being lost. There is no substitute for time spent on the ocean, some  
979 things like how to read the wind, or know the tides, or even claim your fishing  
980 ground cannot be taught in a classroom. These aspects are key to knowledge  
981 production and small, gradual changes like fewer sons of fishermen following in  
982 their fathers’ footsteps changes collective knowledge, which can lead to apathy  
983 towards the environment.

984 The fishermen are knowledgeable because of the education they were  
985 provided by the state, but also because of their collective cooperative (Doyon 2007).  
986 It was enlightening to listen to the fishermen list climate change as the main cause  
987 for fisheries decline, yet not have concern for tourism. Watts and Peet recognize

988 “that environmental knowledge is unevenly distributed within local societies,  
989 second that it is not necessarily right or best just because it exists, and third that  
990 traditional or indigenous knowledge may be of relatively recent invention”(Watts  
991 and Peet 2004). These points help to interpret why the answers were homogenous  
992 among the fishermen, but do not fully explain the lack of contestation or even  
993 acknowledgment of the potential habitat destruction and pollution. Fishermen’s  
994 lives were changed when Fidel Castro took control of the state, and now that the  
995 government is consciously expanding the tourism industry through bilateral  
996 agreements with foreign investors these lives are changing again (Whittle et al.  
997 2002). Therefore, this case is an example of how “environmental knowledge itself is  
998 always, already political and the ways in which some knowledges are privileged  
999 while others are marginalized” is state controlled in Cuba (Mostafanezhad et al.  
1000 2016). This conclusion is not to discredit the fact that the fishermen are educated  
1001 and correct in expressing the concern that climate change and warm waters are  
1002 greatly affecting fisheries negatively, but the lack of questioning the new industry  
1003 shows that while they have a strong connection to their environment, progress and  
1004 financial stability are important to Cubans, who have been at a standstill for so long.

1005 Another aspect that demonstrates the locals’ social capital while  
1006 contradicting the hand that feeds them, is the black market for fish. While the black  
1007 market was not mentioned in the interviews, when riding into town it was not  
1008 unusual to see my neighbor, a casa particular owner who serves fresh seafood daily  
1009 to her tourist clientele and cannot afford to pay state prices. These are the nuances  
1010 that make marine management difficult and the reason why it is imperative to have



1011 stakeholder input (Gerhartz-Abraham et al. 2016). The fishermen contradict  
1012 themselves through their resistance because they know the reason behind the  
1013 legislations. While they are educated and knowledgeable, arguably more so than  
1014 many scientists in this specific area because they have lived and worked on these  
1015 waters for their lifetime, therefore they see the subtle changes occurring day by day  
1016 that accumulate over the years, the desire for financial stability and their  
1017 connections to their communities take precedence over regulations. With  
1018 increasing tourism, this problem of compliance will likely only be exacerbated, but  
1019 will tourism create financial stability if the natural resources are gone?

1020

### 1021 *Apocalyptic Narratives in the Anthropocene*

1022         The reason tourists are flocking to Cuba is for the natural and cultural  
1023 attributes that many fear will soon be gone. The narrative stems from people  
1024 wanting an individual, exclusive experience in a place that is lost in time. People  
1025 want to swim with reef with sharks above a sea floor covered in endangered coral,  
1026 and to dance salsa while drinking mojitos until dawn. To travel is to disconnect; to  
1027 travel, for many, is to escape. However, in the case of Cuba many tourists are  
1028 disconnected from the underlying issues that have created the Cuba that is still  
1029 'intact' today.

1030         The narrative of a ruined location, that development ruins a place, makes  
1031 tourism into another form of colonialism, to exploit a place for its resources and  
1032 then return home. Definitions of development vary from rhetoric like "social  
1033 transformation that allows widespread freedom" to "using the power of the state,

1034 backed by mass people’s movements, to change society in favor of the oppressed,”  
1035 but most seem to focus on obtaining human rights (Escobar 1995). By indulging in  
1036 the apocalyptic narrative of wanting a country to stay underdeveloped or at least  
1037 wanting to get to it before it becomes developed, is placing control over people for  
1038 an experience. It creates a periphery and metropole, an “us versus them”. The  
1039 tourist wants to experience a place and the people for their culture, yet go home to a  
1040 culture that has the choice and freedom to change and progress. By giving value to  
1041 harsh life strategies and the lack of what most tourists would consider daily  
1042 conveniences, it creates a market for oppression. A similar phenomenon occurs  
1043 when we separate ourselves as humans from our environment.

1044 By disconnecting people from their environment or nature, tourism  
1045 commodifies nature. It is not something we are part of, but an experience to buy.  
1046 Sayre explores how “the ancient dichotomy of humans and nature is empirically  
1047 false” because humans are an inherent part of the physical environment and have  
1048 been for “thousands of years” and claims that “the anthropocene has less to do with  
1049 when it began then how it affects the underlying assumptions that scientists made  
1050 about understanding the world” (Sayre 2012). Moore illustrates the importance of  
1051 “how these assumptions affect policy” (Moore 2016). It is more important to  
1052 understand level of impact, not if there is impact, and where on the continuum from  
1053 influencing to dominating people in a specific location are (Crutzen and Steffen  
1054 2003). “Situating tourism...” Zhang explains “in environmental discourse helps us to  
1055 gain a perspective that forces us to rethink linear and logical sustainable  
1056 development paradigms”(Zhang 2016). By rethinking how we are a part of the

1057 landscape instead of disconnected from it, better development and management  
1058 strategies can be integrated. In the cayos, the older generation of fishermen were  
1059 born and raised on them, however they were in structures made of palm trees and  
1060 wooden boats. Decades later, fishermen are still fishing and inhabiting these waters,  
1061 but the cayos are now built up with over 12,000 hotel rooms. The relationship  
1062 between the environment and people has changed from something that was a  
1063 symbiotic relationship to an exploitative one.

#### 1064 **Conclusion**

1065         Small towns like Caibarien and its neighboring tourist hub 7km down the  
1066 road, Remedios, are where unique and perceptively “authentic” experience can be  
1067 had, because there is no show and no fanfare, just people trying to get by. This is  
1068 where taxi drivers are often off-duty doctors because they make more money in tips  
1069 in few days than they do in a month as a physician. These small towns that are what  
1070 many tourists are looking to experience in their quest for an authentic Cuban  
1071 experience. However, there are economic forces that are changing these towns  
1072 rapidly.

1073         The expansion of the economy is bringing what many travelers see as  
1074 unwanted change and what many locals see as at long last progress to the coastal  
1075 regions of Cuba. From the perspective of the local fishermen, the tourism industry  
1076 seems to be the same type of opportunity the fishing cooperative gave them.  
1077 Understanding how they view their environment and how the cooperative gave  
1078 them a career to be proud of, makes one realize why they do not question the  
1079 tourism industry, even if it is destructive to their environments.

1080           This article aims to understand how in a new epoch, the Anthropocene,  
1081 relationships between human resource users and their environment changes as  
1082 manmade industry shapes the ecosystems. Using a political ecology lens allowed for  
1083 historical, political, and cultural context to be woven into underlying ecological  
1084 issues which was imperative to understand in this case study of a coastal region in  
1085 Cuba. The findings for the changing attitudes towards environment were fueled by  
1086 opportunity and security, and a strong patriotism to country. The renewed tourism  
1087 industry is viewed as the fishing cooperatives were, a way to a more stable life, a  
1088 better education, and potential opportunities for the younger generation. The  
1089 change in generations' relationship with the natural environment is one fitting into  
1090 the Anthropocene narrative because the more ecological systems are altered, the  
1091 less they are known. The less the younger generation stewards the ecosystems, the  
1092 more the ecological baseline knowledge changes and erodes. Cuba is undergoing a  
1093 great time of change in all arenas, and how the people of Cuba change their attitudes  
1094 towards the environment will have lasting effects.

1095           Cuba is taking advantage of its undeveloped coastlines and plentiful natural  
1096 resources by building up tourism, however it is in a unique place to see the mistakes  
1097 of its neighbors both north and south, in terms of environmental degradation. The  
1098 Jardines del Rey archipelago is becoming a known destination for its white sand and  
1099 blue waters, however with environmental regulations already violated, the future of  
1100 Cuba's coral reef ecosystems is murky.

1101

1102

1103 **Acknowledgements**

1104 I would like to thank my social fabric and hosts Yunai, Haydee, and Juan  
1105 Karlos and Virginia who orchestrated many interviews let me use her house. I  
1106 would like to thank all of the fishermen of Caibarien for their wonderful  
1107 conservation, open attitude, and coffee. I would also like to thank Jan Vicente for  
1108 checking interview translations.

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1260 CHAPTER 2

1261

1262 Marine Protected Areas of Eden; the narrative of Cuba's coral reefs

1263

1264

1265 **Abstract:**

1266 Cuba has the largest number of Marine Protected Areas (MPAs) of any

1267 country in the wider Caribbean region. In part this reflects the fact that MPAs

1268 dominate discourse within government agencies, scientific institutes, and

1269 nongovernmental entities as the leading policy for the protection of coral

1270 ecosystems and their associated fish assemblages. In 2010, this regime prevails in

1271 an unprecedented 108 MPAs. Increasingly, the scientific literature and media

1272 reporting on Cuban marine resources alludes to Eden, a paradise, a lost jewel in the

1273 Caribbean. The use of Eden rhetoric is not benign. It creates an apocalyptic form of

1274 environmental diplomacy that justifies more and more MPAs in the island country,

1275 despite Cuba's legal commitment to integrated coastal zone management. In a time

1276 of great political and economic change for Cuba, environmental diplomacy with

1277 Cuba must pay attention to its discursive qualities.

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1286 **Introduction**

1287 Marine area management is increasingly important as coastal development  
1288 and climate change threaten ocean ecosystems. The amount of destruction that  
1289 reefs have undergone -- from bleaching to phase shifts to physical damage from  
1290 coastal construction -- has made the concern for coral reef ecosystems and their  
1291 services a global issue for scientists and the public alike. This concern has led to  
1292 hundreds of conservation campaigns and initiatives addressing the problem of reef  
1293 health decline from replanting fragments to reducing greenhouse gas emissions  
1294 (MacNeil et al. 2015). It has also led to a great deal of research that continues to  
1295 grow over how to preserve these essential underwater ecosystems. With scientific  
1296 and management approaches evolving, the rhetoric around how to conserve and  
1297 save coral reef ecosystems has also evolved and taken on various forms from doom  
1298 to resilience (IUCN 2012, Adam et al. 2015). The framing of the discussion around  
1299 the state of coral reefs has greatly affected management and research approaches  
1300 from local to international scales.

1301 In Cuba, the narrative surrounding the country's coral reef ecosystems is  
1302 intrinsically tied to its political associations. Just as there has been limited  
1303 international access to the island country economically, there has been limited  
1304 international scientific-research access to the reefs, inciting curiosity and concern.  
1305 There have been countless examples in the press, environmental non-governmental  
1306 organizations (NGOs) that operate in Cuba, and in scientific and academic literature  
1307 that refer to Cuba and its marine resources, mostly specifically referring to its coral  
1308 reefs, as Eden (Griffin 2012, PBS, Pennisi 2015).

1309 Caribbean coral reef ecosystems have suffered greatly from disease  
1310 outbreaks and overfishing which has contributed to phase shifts from a coral-  
1311 dominated to an algal-dominated reef, therefore to describe reefs in the Caribbean  
1312 as an Eden for marine life is unusual and justifies conservation (Mumby et al. 2007).  
1313 The rhetoric is important because it assumes that Cuba is an anomaly in the  
1314 Caribbean and helps the narrative of Cuba's antiquity and how it boasts not only  
1315 cultural relics but also biological ones. Outside of a marine context Cuba is infamous  
1316 for being labeled as 'stuck in the past'. Havana is perceived as a lost city where most  
1317 aspects of daily life are a time capsule, from the mid-century cars to the crumbling  
1318 architecture, to the political attitudes. Referring to Cuba's reefs as an Eden  
1319 reinforces this idea that Cuba is also stuck in time biologically. Therefore Cuba, in  
1320 both tourism and marine biology, has an apocalyptic narrative, where non-Cuban  
1321 actors want to experience and then save Cuba before it gets ruined. Through  
1322 examination of the Edenic narrative of Cuban coral reefs, the reason why this  
1323 contested method of marine conservation (i.e. Marine Protected Areas (MPAS)) is so  
1324 prevalent in Cuba is examined.

1325

### 1326 **Marine Protected Areas**

1327 Cuba is a leading force in the Caribbean for environmental management and  
1328 conservation (Whittle and Rey Santos 2006). There are 108 MPAs which cover a  
1329 total of 15% of its insular shelf, 35% of its coral reefs, 31% of its seagrass beds, 27%  
1330 of its mangroves, and 16 fish spawning sites that contribute to the government's  
1331 goal of having 25% of the insular shelf be a protected area (Siciliano 2015). The

1332 most famous of the Cuban MPAs is the Jardines de la Reina (Gardens of the Queen),  
1333 which has become the symbol of conservation for the country that has a long legacy  
1334 of progressive environmental protection (Pennisi 2015). The notoriety of Jardines  
1335 de la Reina MPA is an affirmation that the MPA has become the essential marine  
1336 management strategy of our time (Pittman et al. 2015).

1337 Globally the MPA is a prominent model of choice by local and subnational  
1338 governments, nations, and regional bodies at all scales of governance. The  
1339 International Union on the Conservation of Nature (IUCN) defines an MPA as “any  
1340 area of intertidal or sub-tidal terrain, together with its overlaying water and  
1341 associated flora, fauna, historical and cultural features, which has been reserved by  
1342 law or other effective means, it protects part or all of the enclosed  
1343 environment”(IUCN 2012). This definition, allows for broad interpretation, and in  
1344 practice adheres to this inherent vagueness. The MPA is implemented throughout  
1345 the world whether it is declaring an entire archipelago in the Indian Ocean like the  
1346 Chagos Archipelago or to a section of a coastline on St. Lucia (the  
1347 Soufriere)(Sheppard et al. 2012, Geoghegan et al. 2001). MPAs are very versatile  
1348 when it comes to accessibility, which is why many NGOs have made them the  
1349 integral tool for marine management in their foreign projects. The problem with  
1350 accessibility can come from the implementation process as well as the regulations.

1351 If an MPA is enacted from a top-down approach, as in most of the cases in  
1352 Cuba, there is little agency for local resource users to utilize. The lack of access to a  
1353 resource that is used for sustaining livelihoods can be detrimental to a local  
1354 population, while conserving ecosystems that are then used to the benefit of others,

1355 such as tourism. This situation can result in the community becoming more  
1356 marginalized, left without benefits, and without a mechanism in which to vocalize  
1357 the injustices (Bennett and Dearden 2014). When potential negative impacts  
1358 become common results, it is clear that the MPA has too often become a one-size  
1359 fits-all policy in which lacks transparency and locale- specific adjustments (Agardy  
1360 et al. 2003).

1361 MPA's have the potential to play an invaluable role in achieving the  
1362 conservation of coastal ecosystems, however they are not stand-alone solutions to  
1363 resource governance challenges. One of the main problems with MPAs is the  
1364 temptation they create for violation by individuals who are excluded from their  
1365 accustomed fishing grounds or criminal syndicates stealing protected species and  
1366 the concomitant lack of enforcement (Jones 2014). There have been countless  
1367 studies that conclude that they are ineffective tools because the locations where  
1368 they are do not have adequate resources for enforcement and are therefore  
1369 essentially paper parks (Angulo-Valdes et al. 2010 and 2013).

1370 The problem with designating conservation zones without enforcement,  
1371 especially in countries that lack financial resources, is that it creates a phantom, a  
1372 guilt-free conscience, a checked box for environmental responsibility used as an  
1373 international bargaining tool (e.g., World Bank checklist/index for MPA  
1374 governance). By having paper parks, governments can excuse themselves of other  
1375 potentially harmful developments because their MPA mitigates and balances the  
1376 negative consequences of other activities. In many ways MPAs have become the  
1377 corporate social responsibility of the state. By zoning marine areas that often have



1378 vague boundaries and regulations, the respective states or regional body can build a  
1379 façade of protection and accountability. Paper parks can therefore be more  
1380 destructive to the environment, as governments justify the exploitation of another  
1381 location or ecosystem through the counterbalance of a protected area.

1382         This trend of trading destruction for protection of ecosystems has been  
1383 proven ineffective in many arenas, such as the UN's Reducing Emissions from  
1384 Deforestation and Forest Degradation (REDD) program (Evans et al. 2013). It calls  
1385 into question the motives of the state: is their environmental protection and  
1386 management just a bargaining chip or good public relations?

1387         Another issue with MPAs is the definition or lack thereof (IUCN 2012, Jones  
1388 2014, Cruz et al. 2008). The definition is intentionally vague and differs in entity  
1389 and interpretation based upon the enforcement agency. There have been efforts to  
1390 create a global standard for MPAs, however it has been ineffective, as it seems that  
1391 each new NGO or state agency continues to reinvent the wheel (IUCN 2012). The  
1392 lack of definition is essential because it allows for an MPA to be utilized in many  
1393 different ways. The capacity for an MPA to have various levels of regulation is not  
1394 necessarily negative because different levels of protection are necessary dependent  
1395 upon locale, however the lack of differentiation is often used as a convenient excuse  
1396 to be less diligent with regards to enforcement. With the many different definitions,  
1397 it is very difficult for locals and management to understand regulations and  
1398 accessibility to each area (Angulo-Valdes et al. 2013). The idea of the MPA is well  
1399 intentioned and there are examples that demonstrate the benefits of protection,  
1400 however they remain in the minority (Cinner et al. 2016, Angulo-Valdes et al. 2013).

1401 Even with this knowledge of the MPA's inability to achieve conservation, MPAs  
1402 continue to be the model choice for marine management and are expanding.

1403 The growth of the MPA model has led to a scaling up of the regime to a  
1404 marine protected area network (Cruz et al. 2008). Once again, the IUCN has tried to  
1405 set a guideline definition for a system "to connect and protect those areas needed to  
1406 bolster ecosystem functioning so that the overall health of the ocean is not  
1407 jeopardized by human uses" (IUCN 2012). This expansion of the standard model to  
1408 a more ecologically sound, ecosystem-based management is positive, however it  
1409 comes with the same if not more challenges as the original MPA model. The trend of  
1410 expansion is popular with large NGOs and governments alike. The US and UK have  
1411 made a competition out of blue legacies in the Pacific, ever expanding their MPAs  
1412 surrounding small atoll territories to now include entire Exclusive Economic Zones  
1413 (Rieser 2011, Howard 2014). This system has also been utilized by small island  
1414 states that are using the model as an investment in future tourism industry like  
1415 Palau enclosing its EEZ to favor ecotourism (De Santo 2012). However, this  
1416 ecosystem-based management is not a novel idea and has been practiced in many  
1417 locales organically without the state declaring conservation.

1418

### 1419 **Cuban Environmental Policy**

1420 Cuba has been investing in its environment for decades. There were many  
1421 events that gave a push towards state led programs and policies that were beneficial  
1422 to not only the environment because of the lack of inputs, but also because of the  
1423 manner in which environmental policy was established (Evenson 2010). Although

1424 there were efforts during the decades leading up to the fall of the Soviet Union  
1425 regarding marine and terrestrial management, one of the main factors was the lack  
1426 of petroleum products such as fertilizer, herbicide, and pesticide that was no longer  
1427 imported once the Soviet Union dispersed. The collapse led to the change in  
1428 environmental policy out of necessity. The Soviet Union was the main economic  
1429 partner with Cuba once Castro came into power. When the Soviet block collapsed,  
1430 Cuba lost most of its trade relations especially its main export, sugar, and its  
1431 petroleum product lender. This blow combined with the US embargo, which began  
1432 in 1959, left Cuba economically desolate and started the “Special Period” for the  
1433 country. What came out of the ‘Special Period’ was a set of environmental laws that  
1434 follow in the global trend of MPAs, but also, whether intended or not, paved a new  
1435 path in environmental policy (Travieso-Diaz 2000).

1436         Environmental law before the Soviet collapse was based upon Law 33: it was  
1437 vague in definition of environmental threats and did not give directions for action or  
1438 regulations nor have penalties or consequences for violations (Evenson 2010,  
1439 Houck 2000). Law 33 was established in 1981 and termed the Law on  
1440 Environmental Protection and the Rational Use of Natural Resources (Evenson  
1441 2010). It addressed pollution issues but did not contain any limits for wastes and  
1442 was unclear as what constituted a specific waste (Evenson 2010). Prior to Law 33,  
1443 protected areas entered the agenda when an FAO consultant Ken Miller along with  
1444 the Flora and Fauna Commission of the Cuban Academy of Sciences pushed  
1445 proposals for mostly terrestrial protected areas in 1968-73 (Evenson 2010). It took  
1446 almost two decades for any definitive action to take place that coincided with

1447 political and economic events. When the Soviet block collapsed so did most of  
1448 Cuba's economy: it led to environmental law reform (Estrada-Estrada 2004).

1449         The first workshop for the establishment of protected areas occurred in 1989  
1450 when SNAP (Sistema Nacional de Areas Protegidas) was termed (Evenson 2010,).  
1451 More improvements followed in 1994 and 1995. When CITMA (Ministry of Science,  
1452 Technology, and the Environment) was established, in 1994, to improve  
1453 environmental legislation, which was previously being upheld by any agency that  
1454 was relevant to the development project under review causing conflict of interest  
1455 among many government agencies it allowed for the consolidation of review of  
1456 regulations, eliminating the conflict of transparency (Evenson 2010). CITMA was  
1457 also made to develop integrated coastal and ocean management (ICOM) policies  
1458 among others (Gerhartz-Abraham et al. 2016). In 1995, during the second National  
1459 Protected Areas Workshop, marine areas became its own subdivision SAMP  
1460 (Subsistema de Areas Marinas Protegidas) and marine areas came to the forefront  
1461 in the subsequent workshop in 1998 where there were 535 marine area proposals  
1462 (Evenson 2010, Estrada- Estrada 2004).

1463         The new ideology also led to the establishment of Law 81 in 1997, an  
1464 improvement of law 33, which calls for an integrated terrestrial marine system  
1465 (Evenson 2010). Protected areas were specifically defined as “enshrined to protect  
1466 and maintain biodiversity and natural resources, socially and culturally associated,  
1467 to achieve the specific objectives of conservation” (Law no. 81, 1997). Law 81 is  
1468 more explicit and establishes a 3-tier system in which CITMA is the authority  
1469 (Evenson 2010). Law 81 is the first tier, the National Assembly is the second, and

1470 the CITMA is the final. Within CITMA, there is the Centro Nacional de Areas  
1471 Protegidas (CNAP), which is responsible for the regulation of SNAP and SAMP  
1472 (Evenson 2010, Houck 2000). Article 27 under Law 81 shadowed the Rio Summit  
1473 ideals, and therefore sustainable development was the goal (Cruz and McLaughlin  
1474 2008). Once Law 81 was in place, new environmental laws began to follow with the  
1475 ideology of a more holistic ecosystem (Evenson 2010). The SNAP program became  
1476 law through Law Decree 201, which demanded documentation of protected areas as  
1477 well as specified categories of protected areas: Protected Areas of National  
1478 Significance, Protected Areas of Local Significance, and Special Regions of  
1479 Sustainable Development in 1999 (Cruz and McLaughlin 2008). Standard  
1480 restrictions in all federal MPAs in Cuba such as the prohibition of mining were  
1481 established (Cruz and McLaughlin 2008).

1482 Law 212 is the Coastal System Management law that establishes the coastal  
1483 zone considering multiple ecosystems integrated as one (Whittle and Lindeman  
1484 2004). Decree Law 212 created strict regulations for coastal development such as  
1485 prohibiting permanent structures in the coastal zone and the zone of protection,  
1486 which includes 20-40 meters inland from the coastal zone (Cruz and McLaughlin  
1487 2008). It focuses on regulations such as these in order to maintain coastal wetlands  
1488 and mangrove ecosystems during tourism and coastal development (Suman 2013,  
1489 CITMA 2008). In the past decade a new SNAP plan was proposed from 2003-2008,  
1490 which was highly influenced by UNDP and Environmental Defense Fund and focuses  
1491 on pollution prevention and reduction demarcation of SAMP areas and  
1492 reestablishment of natural habitats (Evenson 2010). It also implemented extended

1493 gap analysis that validated SAMP and regional planning spawning aggregation for  
1494 the design and implementation of MPAs (Evenson 2010). The new proposal has led  
1495 to 108 potential MPA sites throughout the country (Evenson 2010).

1496           The amount of environmental policy in Cuba is remarkable given their  
1497 economics and political associations or lack thereof in the past three to four  
1498 decades. While they do follow many global initiatives and trends with marine  
1499 management, upon a closer examination, the laws that they have in place adhere  
1500 more to a marine spatial planning regime. With their integrated management, they  
1501 have successfully incorporated the MPA regime into their existing management  
1502 (Alcolado et al. 2000, Angulo-Valdes 2006). However, how well this management  
1503 works is up for debate.

1504           Cuba is in a unique position because the country has been in an economic  
1505 standstill for over two decades. From this economic isolation, they have excelled in  
1506 other endeavors, such as organic farming and maintaining swaths of intact coral reef  
1507 ecosystems via environmental policy and heavy government control. There is a  
1508 large discourse by scientists and tourists alike surrounding Cuba and the allure of  
1509 the last remaining pristine coral reefs in the Caribbean (Pennisi 2015, Crawford  
1510 2004, Lindeman 2002, Whittle et al. 2002). Now, there is a sudden rush to travel  
1511 there before the masses of Americans flood the country with their capitalism and  
1512 consumerism.

1513

1514 **US-Cuban Political and Environmental Relationships**

1515           The role of the state in the protection of the environment cannot be ignored  
1516 when examining marine management. The trend of the MPA is facilitated by states  
1517 that designate areas for conservation. The relationships between states and non-  
1518 governmental entities within states produce the climate for environmentalism. The  
1519 US is a democratic nation that uses many bureaucratic agencies and departments to  
1520 conserve its marine resources. It relies on legislation for laws to pass regarding the  
1521 environment and its protection. With democracy comes due process and inherently  
1522 approvals that often take years to pass. In the US, there are far more resources than  
1523 Cuba, however they take much more time to come to fruition. In an era when  
1524 ecosystems are collapsing, time cannot be wasted. The centrality of the Cuban  
1525 government and its much smaller governing body allows for decisions to be made  
1526 faster and for laws to be passed in a timely manner (Whittle and Rey Santos 2006,  
1527 Whittle and Lindeman 2004). As fast as Cuba is in passing environmental laws, it  
1528 lacks resources, financially and technologically, to enforce these laws and therefore  
1529 they are often have little value. Cuba's role as a state is also blurred by the amount  
1530 of outside influence of NGOs in the country that have been essential in marine  
1531 management and the implantation of MPAs (Cruz and McLaughlin 2008). Large  
1532 NGOs are a powerful source in the guiding the global marine management agenda  
1533 and Cuba is the crown jewel in the Caribbean (Cruz and McLaughlin 2008, Pennisi  
1534 2015). With increasing cooperation between the US and Cuba, such as the  
1535 beginning of the trilateral MPA agreement in the Gulf of Mexico between Mexico,  
1536 Cuba, and the US, science, environmental protection, and specifically marine  
1537 management are some of the first reconnecting bonds between the two countries

1538 (Cruz and McLaughlin 2008). These common interests are bound to change the US/  
1539 Cuba relationship and Cuban environmental policy with its influx of new capital.  
1540 The true question is: how will Cuba maintain its identity, environmental integrity,  
1541 and socialist values when capitalism encroaches on its shores?

1542

1543 **Cuban Reef Health- Are MPAs the Best Way to Conserve Coral Reef**  
1544 **Ecosystems?**

1545 Cuban reefs are renown in the Caribbean region because of the high coral  
1546 cover and intact food chain that includes apex predators such as sharks (Pennisi  
1547 2015, Fernandez et al. 2011, Gebelein 2011). Cuban reefs are also extremely  
1548 important to the Caribbean region because of current-driven larvae distribution  
1549 (Alcolado et al. 2003, Newman et al. 2006). Many large areas of Cuban reefs still  
1550 maintain large stands of endangered *Acropora* species corals, whose declined health  
1551 in the region has led to disastrous coral to algal reef phase shifts (Alcolado et al.  
1552 2003, Liang and Waltho 2010). These statements, although accurate for certain  
1553 reefs, do not necessarily represent all Cuban reefs. In the scientific community,  
1554 Cuba has become a rediscovered Eden, and a final hope for the Caribbean reef  
1555 (Pennisi 2015). However, the studies that report the intact systems with thriving  
1556 endangered species and food webs do not encompass the entire coastline, but  
1557 specific locations.

1558 From the geography of the island (e.g. climate, tides, currents, topography,  
1559 etc.) as well as its industrial history, the placement of the pristine reefs coincide  
1560 with many qualities such as isolation that are often associated with coral reef health



1561 (Gebelein 2011). One of the few pieces of scientific literature showcasing a more  
1562 thorough investigation of Cuban reefs in more than one locale, written by a Cuban  
1563 from the Instituto de Oceanologia in Havana gives a different depiction of the status  
1564 of coral reef ecosystem (Alcolado et al. 2003). While the chapter does highlight the  
1565 many attributes that reefs in Cuba have, it also exposes the many locations that are  
1566 not pristine, that have been affected by industrialization, and that are polluted  
1567 (Alcolado et al. 2003). The trends in coral health follow what would be expected,  
1568 which is species richness and diversity increasing with distance from large river  
1569 mouths and cities such as Havana (Alcolado et al. 2003).

1570 Another trend involves the geography of the island where winds coming  
1571 from the north affecting the northern coastline with a much more than the protected  
1572 southern coastline (Gebelein 2011). There are two archipelagos of cays on the  
1573 northern coast, which help to buffer some of the wind and wave energy, however  
1574 southern reefs such as those found in the Jardines de la Reina MPA are physically at  
1575 an advantage (Alcolado et al. 2003, Gebelein 2011). In Cuba and most other island  
1576 nations, and especially one who has little imports, overfishing is a problem, which  
1577 has compromised reef health in population regions along the coast (Alcolado et al.  
1578 2003, Wielgus et al. 2014). While this study is outdated by a dozen years, it remains  
1579 important and relevant to the assessment of Cuban reef health because many of the  
1580 studies currently conducted are focused on MPA areas and of those MPAs, very  
1581 isolated ones (Alcolado et al. 2003). With more economic growth leading to  
1582 increased coastal and agricultural development, all Cuban reefs are at risk.  
1583 Increased tourism along with the amount of investment that Cuba has seen in the

1584 past year if not the past months reiterates the importance of the maintenance of  
1585 marine management in the future (Angulo-Valdes 2007, Whittle and Lindeman  
1586 2002).

1587

## 1588 **Methods**

1589 In the Villa Clara province about 180 miles east of Havana, there is a small  
1590 tourist town, Remedios, a local fishing town, Caibarien, and the Cayos, or Cays of the  
1591 Jardines del Rey Archipelago. This region is ideal to examine perceptions and  
1592 attitudes toward MPAs because of the significant number of MPAs, an emerging  
1593 tourism industry, and a state run fishing cooperative.

1594 For this case study, semi-formal interviews were conducted with various  
1595 stakeholders including fishermen, a National Park manager, tourists, locals who  
1596 depended upon tourism (casa particular owners), and scuba instructors who  
1597 operate in the area in the months of January and February 2016. The interviews  
1598 from these stakeholders examined perceptions of marine management and coral  
1599 ecosystem health. Names are not used in order to maintain anonymity. In the  
1600 region of this case study there are two MPAs with a third one currently proposed.  
1601 The first MPA is in the shallow bay between the mainland and the archipelago,  
1602 which boasts extensive mangrove ecosystems. Cooperative members are permitted  
1603 to fish, however new size restrictions, specifically for the lobster fishery, were  
1604 enacted five years ago. The second one is part of a Flora and Fauna Refuge on the  
1605 furthest end of the archipelago off the shoreline of Cayo Santa Maria, where tourists  
1606 pay an entry fee to managers. The proposed MPA contains one of the most popular

1607 dive sites for the dive operation, which is the only dive shop that services the 12  
1608 large all-inclusive hotels that have been built in the last ten years on the archipelago.

1609

## 1610 **Results**

1611         The interviews served as a way to gauge the local perception of marine  
1612 management and coral reef health and proved that there are integrated issues  
1613 ignored by much of the literature. For example, when asked about the MPAs the  
1614 answer from the fishermen was overwhelmingly positive. All of the answers  
1615 indicated that regulations are necessary in order to maintain fisheries stocks and to  
1616 protect them in the future. One fisherman interjected “absolutely. Those places are  
1617 important. These areas can’t protect themselves.” Several others reiterated this  
1618 sentiment with statements like “It is very important for the present and the future.  
1619 We are protecting all of the resources for our fishermen” and “the MPAs are the  
1620 future of our fisheries.” When asked about the biggest threat to fisheries and the  
1621 marine environment, there was also a homogenous response from the fishermen:  
1622 climate change. A majority of these men being *langosteros* (lobster fishermen), they  
1623 depend upon the cold fronts that drive the lobster from the deeper waters to the  
1624 shallows in drove during these climatological events. With change in these seasonal  
1625 events as well as the waters warming, the lobster and other lucrative fish species  
1626 such as grouper are greatly affected. The feedback from the fishermen indicates  
1627 that the MPAs are well received and that the perceived threats to the fisheries and  
1628 ecosystems stemmed from a global problem of climate change. However, other

1629 nuances in how the MPAs were formed and the enforcement of them give a better  
1630 picture of their efficacy.

1631           What many of the fishermen did not speak about was the lack of enforcement  
1632 for the MPA and how the new tourism industry has changed the habitat. When  
1633 asking the fishermen and National Refuge manager about the genesis of the MPA  
1634 and new regulations, it was indicated that these decisions originate from positions  
1635 of power and governmental entities with little to no consultation with the local  
1636 stakeholders. There was no sense of animosity towards the government, but there  
1637 was concern from the Refuge manager about the ability to enforce these areas,  
1638 especially with new tourism industry. Twelve large all-inclusive hotels, all built in  
1639 the past decade or so, are starting to disrespect the boundary lines of the  
1640 MPA/National Refuge by bringing in beach chairs and kite boarding inside the MPA.  
1641 He went on to express concern that the number of hotel rooms proposed for the  
1642 Cayos were 5000 and now have extended to over 12,000 rooms. The reason there is  
1643 little enforcement of the MPA on Cayo Santa Maria is the distance away from the  
1644 Caibarien bay. Since it is the greatest distance away from the bay, the patrol boat  
1645 rarely has the means to reach this area. This finding is congruent with many MPAs  
1646 worldwide, the lack of enforcement gives little legitimacy to the designated area  
1647 (McClanahan et al. 2006).

1648           Another subtle local issue that was not addressed in interviews, but was  
1649 omnipresent in the daily life of fishermen and casa particular owners is the source  
1650 of the fish being served. While fishermen acknowledged the need for regulations  
1651 and veda (closed season) for fishing in order to conserve fisheries, there is a thriving

1652 black market for fish that is not sold to the state. The casa particular owners have a  
1653 demand to serve local seafood daily to their guests and cannot afford the state  
1654 prices. Therefore, many of these owners have sources that allow them to buy  
1655 premium fisheries products at a reasonable local price, outside of the state system.

1656

## 1657 **Discussion**

1658         This resistance to the system indicates the breakdown of the MPA model.  
1659 The fishermen are very knowledgeable especially in marine biology and fisheries  
1660 science. There is no question that they understand that the more they overfish and  
1661 do not abide by the size limits, the less fish there will be in the future. They are  
1662 educated through the fishery cooperative, the same source that provides a  
1663 livelihood, and immense benefits for their families, and for many, the entity that  
1664 gave them a house when the town of Caibarien was built in the years following the  
1665 Revolution. Therefore there is strong sentiment and respect for the government  
1666 politically, however many still stray from the law. There are countless motivations  
1667 for resisting: additional income, social capital and relationships between friends and  
1668 family, disagreement with the regulations, etc. Whatever the motivation, there is  
1669 incentive because there is little enforcement and little social repercussions because  
1670 the regulations were not made by the members of the cooperative. While there is  
1671 great pride in being a member of the fishing cooperative, the MPA does not resonate  
1672 because it is legislation that came from outside the community and with little input  
1673 from the people who rely on the resources.

1674           The pace at which Cuba has implemented the MPA model can be argued to  
1675 have political roots. The lack or disregard of local knowledge and specificity, based  
1676 upon the geography and ecosystem, applied to the management technique makes  
1677 many ineffective. As Campbell suggests regarding sea turtle conservation “ sea  
1678 turtle ecology can mask the politics of their conservation... it shows that promoting  
1679 conservation at a particular scale is not simply a matter of biological or ecological  
1680 necessity, but serves the political interests of particular groups”(Campbell 2007).  
1681 Caveen et al. expands upon this notion of specific group interest influencing policy  
1682 agenda concerning MPA implementation by comparing epistemic communities,  
1683 advocacy and discourse coalitions (Caveen et al. 2013). Understanding influence  
1684 and the factors that comprise it, whether it is top-down or grassroots, and how the  
1685 narrative is formed, and what scientific data it employs, can greatly contribute to  
1686 policy is implementation and efficacy (Caveen et al. 2013). These concerns apply to  
1687 MPAs in Cuba and are reinforced by the rhetoric of Eden when referring to coral  
1688 reef ecosystems.

1689           A problem with this rhetoric of an Eden is how Cuba is an undiscovered gem  
1690 that has so much potential to be discovered. The narrative is reminiscent of Cuba’s  
1691 legacy as a colony, a perfect land awaiting exploitation. Instead of sugar, scientific  
1692 research and conservation have replaced it, as if the US and other foreign entities  
1693 need access in order to legitimately study and manage, instead of the already  
1694 present Cuban Institute for Marine Biology. While funding and resources are  
1695 deficient because of the embargo, using the narrative of Eden makes it seem like it is

1696 a cut-off land ignoring the fact that tourism has been its main economy since the  
1697 80's, only excluding Americans.

1698 Perpetuating the narrative of Eden also presents the idea that the island  
1699 needs to be preserved before it is ruined and this preservation comes in the form of  
1700 MPAs. As aforementioned the model of the MPA comes from the west and is  
1701 performed in many states in the global south via large environmental NGOs. It is a  
1702 static solution that in theory is ideal but in practice on the ground, with lack of  
1703 enforcement can cause more problems as outlined in the case study and supported  
1704 by other literature (Dalton et al. 2015). In fact, a study of 31 MPAs from 14  
1705 countries in the Caribbean concluded that the reasons behind MPAs not achieving  
1706 objectives are because “they might lack human and financial resources to address  
1707 [them]” or because the manner in which the MPAs are governed does not follow  
1708 management plans (Dalton et al. 2015).

1709 Cuba had an integrated coastal zone management policy that protected  
1710 ecosystems holistically from wetland and/or mangroves to the ocean. It prohibited  
1711 building within 40 meters of the coast and therefore was effective and protecting  
1712 large areas of ecosystems. By using an MPA regime the coastal land can be  
1713 developed. With lack of enforcement this is a problem because what is left is a gap  
1714 in the conservation. The MPA directly adjacent to a new all-inclusive hotel is  
1715 ignored. The MPA has then taken on the role as an economic tool, similar to  
1716 corporate social responsibility. MPAs can also be used as geopolitical tools as was  
1717 suggested by Roman and Kraska (Roman and Kraska 2016). The suggestion,  
1718 proposed shortly before President Obama's visit to the island, for a “reboot[ing] of

1719 Gitmo” saw the potential of an MPA to act as a “peace park” between the two  
1720 countries (Roman and Kraska 2016). This peace park model would serve a  
1721 softening of relations to start the thawing relationship by making science and the  
1722 mutual interest of conserving natural resources the ice breaker (Roman and Kraska  
1723 2016). Using the same tool for many purposes, the reason for the tool can be lost in  
1724 the process. Cuba is the largest island in the Caribbean and it is extremely  
1725 heterogeneous from region to region. It boasts diverse people and ecosystems,  
1726 different dialects, and multiple generations that should be addressed accordingly in  
1727 order to make a successful impact.

1728

## 1729 **Conclusion**

1730         The most important issue for marine management, not only in this case study  
1731 but also in locations throughout the world, is the need to look at the ecosystem and  
1732 all of its stakeholders as a system, an integrated unit that has the potential to have  
1733 cascading effects. By cutting systems up into pieces the larger picture cannot be  
1734 seen and forces work against each other instead of together. The fishing  
1735 cooperatives are a large part of why Cuba has been able to maintain its coral reefs as  
1736 the amount of education that the fishermen have is crucial to the conservation of the  
1737 marine resources. The political regime is a large reason behind this, however the  
1738 political climate is changing rapidly and this is cause for concern for Cuba’s marine  
1739 resources. The power dynamics of the creation of the MPAs and the changing  
1740 regulations give insight to lack of enforcement and resistance from the local  
1741 communities. This model contradicts the political beliefs of Cuban people because



1742 while it promotes the conservation for the common resource of the reef ecosystems,  
1743 its execution and origin are more consistent with capitalist policies.

1744         As economics change for the island and remote locations become more  
1745 accessible, the local people will be affected. The MPA will experience change and  
1746 the reefs will need enforcement. In the locations where Cuban reefs are intact and  
1747 relatively pristine can be attributed to many compounding factors including the  
1748 Cuban government's progressive coastal management. The integrated coastal  
1749 management allows for many ecosystems, which interact and feed each other to be  
1750 protected and that is an anomaly in the Caribbean (Estrada-Estrada 2004). There  
1751 are wetland, mangrove, seagrass, and coral reef ecosystems in the same connected  
1752 area and this is why there are locations being called the "Eden" of the Caribbean  
1753 (Pennisi 2015). However, the reason why these ecosystems are intact is a result of  
1754 political history of the island, which has greatly affected the economics. These  
1755 locations are also the places that are being studied the most especially by  
1756 international scientists. The concentration of the studies are remote locales with  
1757 little access and often are designated MPAs. It is difficult to assess how the Cuban  
1758 environmental policies will withstand an influx of investment and capital because it  
1759 is unprecedented under this political framework for the island country. The effects  
1760 of the embargo are seen all along the coast, because there is little development other  
1761 than agriculture and select mining projects, outside of large cities. The organic  
1762 agriculture regime, which many argue was implemented out of necessity because of  
1763 the halt of petroleum imports, like fertilizer, in addition to the lack of hotels and

1764 large industrial developments along much of the coastline definitely have positively  
1765 impacted the coastal and coral reefs of Cuba.

1766           Along with being known as a time capsule for culture and environment, Cuba  
1767 is also known as a hero of Latin American ideals. With the beginnings of bilateral  
1768 agreements with the US, the environment is a common goal for the two neighbors,  
1769 and its relationship is projected to grow into other sectors. How Cuba reacts and  
1770 adjusts to the US and its economic benefit will greatly impact the physical  
1771 environment of not only Cuba, but also political and economic arena of the  
1772 Caribbean and Latin America. The transfer of the MPA model into Cuba's  
1773 governance may be the Trojan horse of capitalism for the island country, but it is  
1774 likely that Cuba will stay on island time for longer than the world expects.

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1987 CONCLUSION CHAPTER

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1989           The components of this thesis examine how Cuban coastal and coral reef  
1990 ecosystems are governed, specifically the MPA regime, and how they are currently  
1991 affected by development, specifically the tourism industry. The compounding  
1992 factors surrounding the reefs from the physical/biological such as climate change to  
1993 the economic like tourism and management will determine their future state of  
1994 health and the future state of their island country. With an economy that is  
1995 becoming increasingly dependent upon tourism, natural resources protection  
1996 should be a core investment for tourism security. Will they follow the same path as  
1997 many in their region before them, losing huge portions of their ecosystem  
1998 communities, or will specific areas be assigned for preservation? Will certain  
1999 species be targeted for conservation and some for exploitation, or will other natural  
2000 forces such as disease outbreak determine species selection before the government  
2001 can decide? Will accessibility to these resources be shut off to traditional and local  
2002 resource users with the influx of tourism and MPAs, as is currently occurring in  
2003 archipelagos? These questions stem from the uncertainty of how Cuban coastlines  
2004 will develop and how development will affect marine ecosystems. A large part of  
2005 how they will develop comes from how they are perceived from both an outsider  
2006 and local perspective and what each stakeholder's motivations are.

2007           With the Cuban economy in a rapid state of expansion and change, due in  
2008 large part to its interactions with the United States, there is a rush to visit before it  
2009 follows the fate of similar surrounding Caribbean islands. The tourism industry is

2010 redeveloping in Cuba at unprecedented rates (COT 2015) with access to the island  
2011 opening to the US. With its increased exposure to the world, through various forms  
2012 of media, and the capital-driven world market, the ideals that this proud country has  
2013 built itself upon are being questioned and challenged from both outside and within.  
2014 A surge of Cubans, many of the younger generations that did not personally  
2015 experience the Revolution, and therefore do not have the same connection and  
2016 motivations as previous generations, are exposed to international influences  
2017 whether it is through technology or personal interaction. There is also a section of  
2018 Cuban society that has always questioned Castro's regime from within, and are now  
2019 being heard for the first time, as censorship controls are loosening. This aspect of  
2020 Cuban culture is not the narrative that most media acknowledge, preferring to  
2021 depict a homogenous group of people, because it is more appealing to tourists, in  
2022 order to maintain the time capsule charm. However, as with any popular tourist  
2023 destination, the more contact there is with other cultures, especially with American  
2024 culture, which views capital accumulation and materialism positively, the more  
2025 culture and political views in Cuba have the potential to change. The rapid influx of  
2026 tourists, due to the apocalyptic narrative of experiencing the authentic Cuba, is  
2027 testing the infrastructure, environmental policy, and the economic values that many  
2028 citizens and the government rely upon (Morales 2016).

2029           The apocalyptic narrative also affects how the marine management is  
2030 approached because it introduces an urgent time value influencing conservation and  
2031 scientific research. There are many international entities looking for a stronghold in  
2032 the environmental sector and in the investment aspect of Cuba because of the

2033 language that surrounds the marketing and reporting from tourism to science alike.  
2034 The need for conservation has influenced Cuba to scale up its marine protected area  
2035 regime, despite not investing in more enforcement. In numerous peer-reviewed  
2036 published papers, language like “despite the obvious advantages of ecosystem-based  
2037 management, its operationalization is still far from achievement”, is omnipresent,  
2038 indicating the inefficacy of the current strategy (Angulo-Valdes and Hatcher 2010).  
2039 MPAs are the policy of choice, both of the international community and of the Castro  
2040 regime and it is known that they are more often unsuccessful than effective.  
2041 Nonetheless, Cuba is adding more MPAs to its governance system. The MPA can be  
2042 a negative factor in governance if regulations come from the top down, and the  
2043 implementation and enforcement are weak.

2044           In the region where I conducted my case study, the majority of the people  
2045 who utilized the waters were fishermen and tourists. This is not the case for many  
2046 places in Cuba; it is different where beaches are more accessible to locals. But in the  
2047 town of Caibarien the beaches were on a dark blue bay with and the drive out to the  
2048 cayo beaches was about 40 minutes by taxis, with a military toll and check booth en  
2049 route. Therefore, many people, including my host family had never been out to the  
2050 beaches on the cayos. Most of the coastal towns had never been there for  
2051 recreational purposes. Thus, tourism and the capital it brings is seen by Cubans as  
2052 positive. Many people do not have the luxury to prioritize environment over basic  
2053 needs, nor give the beach an intrinsic value because is it not a commonly  
2054 experienced landscape.

2055           The fishermen respect the state immensely and are very proud and patriotic  
2056 to be part of their fishing cooperative, but that does not mean that they will not  
2057 stray outside the law. This finding does not include all fishermen, but there is a  
2058 strong presence of a black market for fishing by both cooperative members and  
2059 illegal fishermen (i. e., fishermen not members of the state run fishing cooperatives).

2060           If local participation in coastal and marine management is desirable, Cuba's  
2061 managers need to understand the motivations of the local people and their daily  
2062 lives. Those formulating new marine management policies need to understand the  
2063 motivations behind the fishermen, who are the main resource users other than  
2064 tourists, in order to achieve and maintain compliance. In my six weeks of fieldwork  
2065 I saw an enforcement boat only leave the bay once, and when I asked about the  
2066 punishment for breaking a regulation it was nonchalantly answered with "just a  
2067 fine". The fishermen are educated men who understand what overfishing can do to  
2068 their ecosystem. However, it is difficult for them to not take a lobster or two that is  
2069 a centimeter below the minimum size limit especially when a new hotel that just  
2070 ripped out 500 yards of shoreline mangroves, will pay inflated prices for it. Cubans  
2071 currently have no incentives to abide by the regulations. These incentives must be  
2072 created before fishermen will follow regulations.

2073           My main findings suggest that in order for the Cuban state to improve its  
2074 current structure of marine management, it needs to treat the coastal ecosystems  
2075 and all of its stakeholders as a unitary system, as the Decree-Law 212 did. By  
2076 breaking coastal ecosystems up into smaller areas, the larger picture cannot be seen  
2077 and forces work against each other instead of together. The fishing cooperatives are

2078 a fundamental part of why Cuba has maintained its coral reefs and the amount of  
2079 education that the fishermen have is essential to the conservation of the marine  
2080 resources. The political regime is a large reason behind the success of the  
2081 cooperative, however the political climate is changing rapidly and this is cause for  
2082 concern for Cuba's marine resources.

2083         Tourism is expanding and it will provide great opportunity for many Cubans,  
2084 which is something that they are entitled to. Cuba has a good structure for  
2085 environmental policy with Decree-Law 212 that, if built upon, would allow for a  
2086 sustainable development model for coastal tourism (Gerhartz-Abraham et al. 2016).  
2087 Unfortunately the state does not seem to be holding the hotel developers  
2088 accountable and the strong environmental policies are being ignored. When the  
2089 resident ornithologist and manager of the Flora and Fauna Refuge on Cayo Santa  
2090 Maria was asked about the tourism, he acknowledged being disappointed. He was  
2091 already confronting tourists and hotel employees who were not respecting the MPA  
2092 and Refuge, and this disregard is destroying the coastal habitat. The destruction  
2093 was visible to anyone who drove past the site of one of the hotels under  
2094 construction with rows and rows of cement and rebar, and dredges in the ocean  
2095 spraying up sand for the cement mix. I was there in the time in between, on the  
2096 brink just before the changes that would be able to be felt nationally, not just  
2097 regionally.

2098         It is not nostalgia or wishing for Cuba not to develop, but for improvement in  
2099 the manner in which it is developing. Many scientists and environmentalists believe  
2100 that Cuba has a responsibility to maintain their environment as best they can, and



2101 applies this to all of their ecosystems, not just the coral reefs, but wetlands, and  
2102 forest areas as well. Cuba knows that they possess natural resources that in many  
2103 places cannot be brought back, and they see the destruction of places so similar to  
2104 them, like the Florida Keys. The environmental policy is in place, however it needs  
2105 enforcement and integration with land use regulation and offshore industrial  
2106 controls. The answer of how to achieve more compliance and enforcement is  
2107 difficult, however it should be attempted whether by joining forces with outside  
2108 entities to help bring MPA strategies for enforcement and stakeholder engagement  
2109 in, or to simply not allow some coastlines to have hotels within a given distance  
2110 from the coast (MOU 2015). Investing in autonomy and local interest may be a  
2111 strategy worth investigating.

2112 This thesis research contributes to literature on the implementation of  
2113 marine management on a local level in Cuba. It emphasizes the conclusion of the  
2114 need for specialization of management according to site because of the social and  
2115 economic factors that influence compliance and stewardship. In the great time of  
2116 change and development for the area, more of a voice was necessary for both the  
2117 fishermen and the MPA managers in order to achieve any environmental impact. As  
2118 fast as change is occurring in Cuba, people love their country and are loyal to their  
2119 government. While financial gain through more foreign investment is promising for  
2120 the improvement of livelihoods, investment in the resources that led to tourism  
2121 development should be conserved. Cuba has a great opportunity to create a new  
2122 path of development because its national natural resources are such anomalies in  
2123 this region.

2124           The potential for future studies in this region are endless because the  
2125 addition of new MPAs and development. Both ecological and policy studies would  
2126 be informative to see the efficacy of the new MPAs, and to see if compliance changes  
2127 with generations. Future research on the state of the coral reef ecosystems and if  
2128 coral health and fishery health improve with the MPA could contribute to literature.  
2129 As more capital moves through the region with more tourism development, it would  
2130 be interesting to see if fishery cooperative management changes as the economic  
2131 regime slowly shifts to a capitalist market, and if new capital and civil society  
2132 interest will illicit more enforcement strategies.

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