UNIVERSITÉ DU QUÉBEC À MONTRÉAL

CREATING A DISCURSIVE ECOSYSTEM FOR A CLIMATE CHANGE AFFECTED TOURISM DESTINATION: CO-EVOLUTIONARY NEOLIBERAL INTERACTIONS BETWEEN THE TOURISM, MANAGERIAL AND SCIENTIFIC DISCOURSES

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LA CRÉATION DE L'ÉCOSYSTÈME DISCURSIF D'UN SITE TOURISTIQUE AFFECTÉ PAR DES CHANGEMENTS CLIMATIQUES : INTÉRACTIONS ENTRE LES DISCOURS TOURISTIQUE, MANAGÉRIAL ET SCIENTIFIQUE

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DE LA MAÎTRISE EN DÉVELOPPEMENT DU TOURISME

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EMC – Environmental Management Charge

GBR – Great Barrier Reef

GBRMP – Great Barrier Reef Marine Park

GBRMPA – Great Barrier Reef Marine Park Authorityà

Reef – pertains to the entire Great Barrier Reef Region

UNESCO – United Nations Education, Scientific and Cultural Organization

UQÀM – Université du Québec à Montréal

ABSTRACT

Abstract: Using an interdisciplinary approach, this study provides a critical understanding of the discursive ecosystem surrounding a natural tourism destination affected by anthropogenic climate change through the case study of the Great Barrier Reef. In drawing parallels to the Red Queen Hypothesis, this study contends that there exists parasitic, symbiotic and competitive co-evolutionary relationships between the tourism promotional discourse, the scientific discourse and the managerial discourse of the Great Barrier Reef which each create different representations of the ecosystem. In turn, this research shows how this complex discursive ecosystem enables tourism to harness the destination's critical ecological health status through modified tourism practices instilled in neo-liberal commodification of both nature and ecological disaster, a term I have coined as *disaster capita-tourism*. Critics and researchers have long identified tourism's ability to ensure its perennity through neo-liberal practices and forms such as last chance tourism and disaster capitalism. Building upon these studies, I highlight how science and management are critical discursive agents in enabling tourism's ability to sustain itself through neo-liberal disaster commodification practices and strategies.

Keywords : tourism, discourse, neoliberalism, discursive ecosystem, disaster capita-tourism, Red Queen Hypothesis

RÉSUMÉ

Résumé: En utilisant une approche interdisciplinaire et l'applicant à l'étude de cas de la Grande barrière de corail, cette étude fournit une comprehension critique de l'écosystème discursif d'un site touristique naturel affecté par les changements climatiques antropogéniques. En utilisant le *Red Queen Hypothesis*, cette étude démontre qu'il existe des relations co-évolutionnaires parasitiques, symbiotiques et compétitives entre le discours promotionnel touristique, le discours scientifique et le discours managerial de la Grande barrière de corail qui, à leur tour, créent plusieurs représentations différentes de l'écosystème. Par conséquent, cette étude démontre en quoi cet environment discursif complexe permet au tourisme d'exploiter l'état écologique vulnérable d'un site touristique naturel en employant des pratiques touristiques néolibérales intégrées dans la commodification de la nature et des désastres écologiques, un terme que j'ai surnommé *disaster capita-tourism.* Plusieurs études identifient depuis longtemps la capacité du tourisme à assurer sa pérennité grâce aux pratiques néolibérales telles que le tourisme de dernière chance et le tourisme de désastre. En m'appuyant sur ces études, je démontre pour la première fois comment le corps scientifique et le corps managerial sont des agents discursifs importants qui permettent au tourisme de se maintenir en employant des tactiques néolibérales qui commidifient les désastres écologiques.

Mots-clés : tourisme, discours, néoliberalisme, écosystème discursif, capita-tourism de désastre, Hypothèse Red Queen

CHAPTER 1
INTRODUCTION

The environmental degradation of natural sites has many implications for the tourism industry (Salvatierra and Walters, 2017: 73). In fact, as mention Becken and Hay (2007, in Buzinde *et al.*, 2010: 582), the tourism industry recognizes that climate change, one of the largest phenomena causing degradation of natural environments, will have important direct impacts on natural landscapes. Due to the fact that this industry often depends on the environment and natural landscapes (Scott *et al.*,2005), the transformation of the latter due to global climate change simultaneously results in the transformation of tourism space (Lapointe *et al.*, 2019). To survive, the threatened and vulnerable tourism destinations will have to adapt (Jenkins, 2017: 41). More specifically, those who make use of these vulnerable tourism destinations, which includes but is not limited to tourists, tourism organisations, tourism managers and tourism marketing agencies, will have to adapt their practices if tourism is to continue within the ever-transforming space.

Climate change causes multiple ecosystem transformations ranging from the structural, functional and composition levels (Warner *et al.*, 2010: 690) and thus of tourism spaces (Lapointe *et al.*, 2019). These transformations may contribute to the restructuration or even the degradation of the affected ecosystem (Warner *et al.*, 2010: 690). Although climate change may affect all natural tourism destinations and their ecosystems, coastal and mountainous environments are amongst the most susceptible (Scott and McBoyle,2007). In addition, polar regions are extremely vulnerable to the

effects of climate change (Dawson *et al.,* 2010: 320). In undergoing transformation and degradation by climate change, tourism destinations in the especially fragile environments mentioned above may be subject to the transformation of their images and representations.

The marketing and publicity of a tourism destination both play critical roles in the production of its image (Goss,1993: 663). Since contemporary tourism presents tourists with a photographic itinerary of objects (Goss, 1993: 663), its promotion presents utopic images of the destination (Goss,1993: 664). The idea that tourism is an ideological and utopic construct has been strongly discussed by Enzensberger (1996) and continues to be apparent in the promotional tourism discourse (see Goss, 1993; Buzinde *et al.,* 2009; Buzinde *et al.,* 2010; Salvatierra et Walters, 2017). However, when a destination is subject to negative environmental transformations due to climate change, the latter present important challenges for marketing teams who use utopic images in order to create representations of the tourism destination through the promotional discourse (Goss, 1993). In fact, in their studies, Buzinde *et al.,* (2009) and Buzinde *et al.,* (2010) were able to show that tourism brochures were still using picturesque, idyllic, and utopic images to promote Playacar Mexico, although this destination has been and continues to be severely affected by climate change through coastal erosion. The concept of creating idyllic representations of a tourism destination, regardless of its actual state of degradation, can be referred to as *representational dissonance* (Lowenthal, 1985 in Buzinde *et al.,* 2010: 334**).** Lowenthal (1985 in Buzinde *et al.,* 2010: 334), in using the term *representational dissonance*, shows that there are disparities between what is presented in the images created by the promotional discourse and the real & accurate image of the

tourism destination. Importantly, when referring to an environment or tourism destination's ''real and accurate state'', the author is referring to the spaces' current ecological state and health status.

The disparities between the two types of images mentioned above have also been addressed through Goodman's (1978) concept of *worldmaking.* In adopting the concept of *worldmaking* under the light of tourism studies, Hollinstead (2009: 643) defines it as ''the creative and often ''false'' or ''faux'' imaginative processes and projective promotional activities that management agencies, other mediating bodies, and individuals strategically and ordinarily engage in to purposely (or otherwise unconsciously) privilege particular dominant/favoured representations of peoples/places/pasts within a given or assumed region area, or ''world'' over and above other actual or potential representations of those subjects''. Hollinshead and Suleman (2018: 204) therefore argue that the tourism industry's role is to act as an agent of fabrication of spaces as opposed to one who creates mirrored or accurate representations of such spaces. This research, however, is rather specifically interested in the role taken up by the tourism industry in creating spatial representations of tourism sites which are affected and transformed by climate change. Notwithstanding, there is a lack of literature that has attempted to compare the promotional discourse and the ecological state of a tourism destination which has been degraded by such climatic disturbances. Specifically, there is a lack of literature which presents the 'real' and accurate health status of a tourism environment through the use of ecological measures, such as the ecological scientific discourse, in order to draw comparisons with its promotional discourse. The proposed research will therefore employ an interdisciplinary approach to analyse climate change, through three specific discourses, in relation to tourism. The three discourses evoked are the

ecological scientific discourse, the promotional tourism discourse and the managerial discourse. While the ecological scientific discourse is comprised of published scientific literature, the promotional discourse is made up of all written and verbal communication by marketing agencies or tourism operators of a specific tourism destination. Next, the managerial discourse consists of documents, publications and verbal communications made by the tourism site's managing authorities.

Ecosystems which are extremely vulnerable to the effects caused by climate change are often accompanied by a promotional discourse that seems to create an image of the destination that is different than its real state (Goss, 1993: 672). The promotional discourse creates idyllic and utopic images and representations of the tourism destination (Goss, 1993). However, the ecological scientific discourse rather seems to adopt a discussion of the transformation of the ecosystem, the result in the changes in its ecological functioning, the effects of species biodiversity, etc., all while utilizing and presenting empirical data and evidence. On the other hand, management agencies may have vested interests in the environment's sound ecological state and success as a tourism destination. Thus, management agencies may adopt a discourse that depicts the destination's ecological state all while promoting tourism for its associated capitalistic gains. An ecosystem that is both extremely vulnerable to the effects of climate change but also continues to be an important tourism destination at the international level is the Great Barrier Reef (GBR). As such, the GBR's images created by the promotional discourse and the scientific ecological discourse may be significantly different whereas the managerial discourse may be articulated as somewhat of a middle ground.

In being interested in the representations of the GBR, Salvatierra and Walters (2017: 76) mention that there is ‘‘an emphasis from scientific and natural resource management committees on the impact that climate change is having on the icon’s ecosystem, claims from the tourism community itself that the health of the reef is deteriorating and the presence of global marketing campaigns positioning the reef as a last-chance destination’’. Salvatierra and Walters (2017: 76) therefore refer to the fact that there are multiple representations of the ecosystem. The scientific ecological discourse discusses the effects of climate change which result in an increase of mass coral bleaching events and tropical cyclones, which in turn cause a significant decrease in coral cover (Ceccarelli *et al.,* 2009: 1). Since modern corals do not have genotypes or phenotypes that can adapt as quickly to the increasing temperatures than the rate of change in global temperatures (Hoegh-Guldbert *et al.,* 2007: 1738), the increase and accumulation of atmospheric carbon dioxide concentrations, an important effect of climate change, pose a serious threat to the survival of coral reef ecosystems. As ecosystems, coral reefs are extremely vulnerable to the increase of mean global temperatures and to water acidification. While climate change and ocean acidification are different concepts, they are related. In fact, increased atmospheric C02 is correlated with anthropogenic fossile fuel use resulting in climate change. By association, increased ocean acidification results as a by-product of atmospheric accumulation of C02 where there latter’s excess gets absorbed by the ocean (Canadelle *et al.,* 2007: 18867). Thus, while the concepts of climate change and ocean acidification are different, they are closely related and both relevant to the ecological health of the GBR. With a carbon dioxide atmospheric concentration now elevated over 380 ppm (Hoegh-Guldbert *et al.,* 2007: 1737), approximately 25% gets reabsorbed by the ocean (Canadelle *et al.,* 2007: 18867). As carbon dioxide is absorbed into the ocean, it undergoes a chemical reaction with

water to form bicarbonate ion and protons, which in turn react with carbonate ions to form an excess of bicarbonate ions (Hoegh-Guldbert *et al.,* 2007: 1737). The latter creates a shortage of carbonate reserves for marine organisms, being deadly for those who are dependent on calcification, such as corals (Hoegh-Guldbert *et al.,* 2007: 1737). In consequence of this high level of climate change effects, the GBR has suffered an immense decline in coral cover over the last 55 years (Hughes *et al.,* 2015: 508; Hoegh-Guldbert *et al*., 2007: 1738). In fact, coastal reefs have lost approximately 40% coral cover since 1986 (Hugh *et al.,* 2011: 653). When repeated, such climate perturbations can contribute to the persistent loss of coral, which ultimately decreases both the biodiversity and ecological functioning of the ecosystem (Nörstrom *et al.,* 2009: 296). Importantly, other non-climate related stressors such as coastal development, land-based-run-off and direct use additionally negatively contribute to the GBR's ecological values and decline in coral cover (GBRMPA, 2019: 186). This decline therefore leads to a decrease in social, ecological and economic values of coral reefs (Moberg and Folke, 1999: 222), such as the GBR. As such, scientific literature on the GBR and its health have become increasingly important in the scientific discourse (Piggott-McKellar and McNamara, 2017: 397), especially since Wolanski and De'eath's (2005) publication projecting an ecosystem collapse by 2100. Since this publication, UNESCO has showed an interest in adding the GBR to the ''in danger'' list (Hugh *et al.,* 2015 in Piggott-McKellar and McNamara, 2017: 397), which has gained the attention of the media (Piggott-McKellar and McNamara, 2017: 409) and therefore of many tourists.

Despite its decline in health, this media attention in addition to tourism destination promotional material have resulted in GBR visitation rates of over 2,000 tourists yearly since 1994, a number

which increases annually (GBRMPA, 2019: 111). Importantly, as shown by Lenzen *et al.* (2018: 522), tourism is responsible for the consumption and emission of 8% of global greenhouse gas emissions. While many popular tourism destinations on the GBR are at long distances from the Australian coast and that the GBR is an international destination for many tourists, the greenhouse gas emissions associated with its visitation are elevated (GBRMPA, 2019: 111). As such, the tourism industry seems to be negligent of, or willing to turn a blind eye to, the effects of climate change on the GBR's health status as it is one of its major contributors. The increase in tourism numbers may be attributed to the fact that the promotional discourse positions the GBR as a last chance tourism destination (Salvatierra and Walters, 2017: 76), which at first glance is a highly different message than is communicated by the scientific ecological discourse.

As mentions Overton (1973: 35 in Cheer *et al.,* 2019: 559), tourism can also be presented as a means to save natural environments. In fact, the commodification of nature as a method of conservation has been highly discussed in tourism literature (see Fletcher, 2010; Fletcher 2012; Fletcher 2015; Igoe and Brockington, 2007; Ojeda, 2012). Destination marketing organizations (DMOs), tourism agencies and organizations often promote ''conservation interventions [which] increasingly emphasize neoliberal market mechanisms designed to incentivize preservation by demonstrating the economic value of *in situ* natural resources'' (Fletcher, 2012: 295). As a result, the promotional and oftentimes management discourses promote tourism sites as a means of ecological conservation. This type of practice can often generate manifestations and discontentment in the ''many groups which make up the ecology movement'' (Overton in Cheer *et al.,* 2019: 559). As certain authorities allow access to an overabundance of tourists, which is

often seen in last chance tourism destinations, the ecosystem can be subject to important ecological stresses (Cheer *et al.,* 2019: 560). Thus, there may be disparities between priorities communicated by different discourses such as the protection and conservation by the scientific ecological discourse and the positioning of a site as a last chance tourism destination and the need to increase visitor influx by the promotional discourse. In having vested interests in both the environment's success as a tourism destination and in its long-term ecological conservation, the managerial discourse may be one that is somewhat divided. However, in highlighting an ecosystem's poor health status and ecological degradation in the face of global climate change, the scientific ecological discourse may inherently fuel the promotional and managerial discourses of last chance tourism. Thus, while both the ideas of last chance tourism and neoliberal commodification of nature have been highly discussed in current tourism literature, their combination and its relevance to the ecological scientific discourse is a topic which remains largely unexplored as of yet. In addition, little to no research has compared the textual and the imagery components of the promotional discourse advocating for continued tourism of destinations negatively affected by climate change.

Scientific literature, through its ecological discourse, clearly demonstrates the decline in health of the GBR due to the effects of climate change where this discourse seems to paint a non-utopic but rather realistic image of the popular tourism destination. Yet, tourism maintains its position as the most reef-dependant industry in the GBR region and continues to see increasing visitor numbers (GBRMPA, 2019: 112). In communicating a discourse promoting the continuation of tourism, the promotional discourse, at first glance, seems to paint an image of the GBR that is entirely different than does the scientific ecological discourse. In using the theoretical angle of the Red Queen

Hypothesis, this study proposes the presence of co-evolutionary-like competition between the ecological scientific discourse and the promotional discourse in the creation of images and representations of tourism destinations in degradation through the hands of climate change. To do so, this research utilizes the case study of the GBR.

The Red Queen Hypothesis, a theory used in biology, was proposed by biologist Leigh Van Valen in 1973. To explain the phenomenon of evolution and adaptation between species in competition, Van Valen referred to a particular scene in Lewis Carroll's (1872) *Alice's Adventures in Wonderland*, where Alice and the Red Queen stayed stationary despite running as fast as they could. The Red Queen Hypothesis therefore suggests that species and their competitors adapt to their specific environments due to evolution and ''states that for an evolutionary system, continuous development is needed just to maintain its relative fitness'' (Heylighen and Campbell, 1995 in Carmona, 1996: 15). Despite the fact that this theory has a biological sciences basis, it has been used in tourism studies in order to discuss the notion of conflict between humans, climate change and disappearing tourism destinations (Jenkins, 2017). However, this current study proposes that the scientific ecological discourse and the promotional discourse compete in order to create different images and representations of tourism destinations affected by climate change. While the ecological scientific discourse seems to value the conservation and protection of an ecosystem in painting an uninviting and destructed image, the promotional discourse seems to encourage its tourism in painting idyllic images or one of a last chance tourism destination. Meanwhile, management discourses may paint an image with similar components to each of the two discourses as it is in its best interest to promote tourism all while ensuring long-term sustainability and proper

conservation of the ecosystem. It is in this context that this study addresses how the promotional discourse, the scientific ecological discourse and the managerial discourse contribute to the construction of tourism destination images affected by climate change in order to create representations that are specific to each of their personal interests. To sustain its argument, the study will:

a) analyse the promotional discourse, the scientific ecological discourse and the managerial discourse in the production of destination images;

b) compare the three discourses and their images of the GBR;

c) examine how the three discourses interact to ultimately contribute to the commodification and neo-liberalisation of nature.

CHAPTER 2
LITERATURE REVIEW AND THEORETICAL FRAMEWORK

2.1 Anthropogenic climate change and tourism

The concept of climate change, albeit increasingly popular in the current scientific literature, is one that is not always consistently defined in said literature. For the purpose of this study, a concept brought about by the phenomenon of climate change, anthropogenic (or accelerated) climate change, will be used. Much like the concept of climate change, that of anthropogenic climate change is not always consistently defined in literature. However, a study by Rowland (1999) briefly attempted to provide its definition. Rowland (1999) suggests that anthropogenic climate change is primarily a result of the increase of carbon dioxide levels in the atmosphere due to the use of fossil fuels by humans. As such, Rowland (1999: 109) states that ‘‘[a]ccelerated changes are most likely to occur due to enhanced greenhouse warming’’. Rowland (1999) therefore further affirms that anthropogenic climate change causes changes in hydrological systems, climatic regimes, and sea surface levels. Further, in defining anthropogenic climate change, Haynes *et al.* (2014) refer to the rapidly changing temperatures. Anthropogenic climate change will therefore have an impact on agriculture, forests, coastal zones, ecosystems, biodiversity and human health (Rowland, 1999). As a result, the concept of anthropogenic climate change, for the purpose of this research, is defined as climate changes that are engendered by the human use of fossil fuels which cause rates of temperature that fluctuate faster than those would if there were no accumulation of atmospheric

carbon dioxide. Anthropogenic climate change may therefore ultimately have an effect on all that is living.

Climate change has the potential to impact the tourism industry through the alteration of the attraction of its destinations (Goldberg *et al.*,2011: 507). Indeed, Goldberg *et al.* (2018: 509) suggest that climate change impacts may affect tourism destinations through various ways which can be separated in five distinct categories: "'direct climatic impacts, indirect environmental change impacts, impacts of mitigation policies on tourist mobility, indirect societal change impacts and attitudinal and behavioural change impacts''. While many tourism activities depend on environmental assets, climate change is expected to transform the latter (Goldberg *et al.,* 2011: 509). Negative indirect environmental impacts brought about through climate change may range from decreases in coral cover, biodiversity, and ecosystem services such as coastal protection (Goldberg *et al.,* 2011: 509). While tourism greatly depends on natural resources and ecosystems (Buzinde *et al.,* 2010), their destruction or negative alteration resulting in significant ecosystem loss and degradation is crucial for the tourism industry. As such, climate change may have negative indirect impacts for the tourism industry (Goldberg *et al.,* 2011: 509) as it can transform not only the physical space of a tourism destination but also its image.

2.2 Climate change and destination image

The construction of a tourism destination's image is strongly affected by advertising and marketing (Goss, 1993: 663). In a study conducted by Goss (1993) which analyzed the strategies employed in magazine advertisements meant to promote Hawaii to United States citizens, it was shown that approximately 66% of tourists claimed to have been influenced by advertisements in their decision to visit the destination. Therefore, it is evident that marketing tools such as advertisements play a critical role in destination imagery. Through the promotional discourse, tourists are often promised that they will ''*see, watch, witness, behold, look at,* and *look into* scenic wonders, vistas, views and sights'' (Goss, 1993: 672). Thus, advertisements and promotional material promote tourism as a unique experience where visitors will experience various different landscapes and cultures, which Urry deems as the romantic gaze (Urry, 1990: 45 in Goss, 1993: 667). The promotional and marketing discourse has the ability to enhance the romantic gaze through photography (Goss, 1993: 672). Indeed, the role played by photography is critical in destination representation and imagery as the image appears as a realistic portrayal of the destination (Goss, 1993: 672). Thus, Goss (1993: 672-673) suggests that ''[t]he photograph appears to be a casual witness, an objective trace of reality (…) [where the observers and potential tourists are] predisposed to accept the image as real even though [they] 'know' of the presence of the photographer, technicians, and lighting arrangements, of the posing of the professional models, and the subsequent manipulation of the image through cropping and retouching''. Ultimately, the photographs function as the creation of idyllic representations of a tourism destination through the presentation of pristine images of the destination's landscapes (Goss, 1993: 673). Although Goss (1993) addresses the promotional discourse's tools in creating idealized representations of tourism destinations, the author does not

analyze how tourists respond or react to the advertisements or brochures communicated by the tourism discourse, nor does he address this concept in respect to a destination severely affected by global climate change. Conversely, the latter two points are taken up in Buzinde *et al.'s* (2010) study undertaken in Playacar, Mexico.

Climate change is often discussed in tourism studies through analyzing the unstable elements that are subject to transformation in natural landscapes (Buzinde *et al.,* 2010: 582). However, tourism promoters tend to portray destinations as stable and controllable (Buzinde *et al.,* 2010: 582), which is far from reality when such destinations are subject to climatic disturbances and active transformation from global climate change. Thus, according to Buzinde *et al.* (2010b in Buzinde *et al.,* 2010: 582), ‘‘the production of essentialist representations that portray stable, pristine and favorable natural environments will be increasingly undermined and threatened by global climate change; a phenomenon with the potential to alter the biological and morphological structures of natural landscapes within relatively short periods of time’’. While Buzinde *et al.* (2010: 582-583) recognize that the construction of destination images and representations by tourism promoters driven by select marketing criteria is a large component in tourism production, it is argued that most promoters assume a static relationship between humans and nature, thus driving the production of idyllic destination representations and imagery. However, the literature pertaining to the ways in which a tourism destination affected by climatic disturbances and global climate change is portrayed in the promotional discourse is limited. In analyzing how coastal landscapes negatively affected by global climate change are represented in said discourse, Buzinde *et al.* (2010) have shown findings similar to Goss' on the construction of a destination's pristine image through the

utilization of the romantic gaze. Indeed, despite the fact that ‘‘Playacar’s once sandy shoreline [is now] littered with large, orange dredging tubes and gigantic geotubes and the tranquil sound of the waves [gets] muffled by the cacophony of numerous generators that powered the dredging machinery (…) [t]he brochure portrayals of Playacar offered a pristine frame of the coastal landscape’’ (Buzinde *et al.,* 2010: 588). The destination was further represented through immaculate images of ‘‘enchanting coastal landscapes, *expansive* white sandy shorelines with beach crescents, luxuriant growth of palm trees, and depictions of vivacious colors against the backdrop of sun kissed turquoise water that melted into the clear blue skies’’ (Buzinde *et al.*, 2010: 592). However, the use of pristine imagery in the representation of tourism destinations is not the only component of the promotional discourse. It is the combination of both imagery and textual components that make up the latter discourse. As Goss (1993: 665) states, ‘‘[t]he first task of the advertiser is to attract the attention of the targeted readers and address them as prospective visitors’’. Thus, it is evident that both pictures and discursive material are necessary to attract tourists to a certain destination. Indeed, tourism advertisements utilize both images and text to pique curiosity within readers, which positions them as potential tourists (Goss, 1993: 665). The text found in the promotional discourse complements the photography using certain adjectives and contextual material (Goss, 1993: 676). In examining advertisements of Hawaii, Goss (1993: 676) highlights the use of text and images which represent the destination as a Garden of Eden where this representation is reinforced using both verbal and visual references to beaches, exotic flowers, tropical gardens and other paradisiac icons. Furthermore, the use of certain adjectives such as lush, rich, fertile, and the utilization of textual promises such as being able to ‘‘*smell* flowers (…) and the scent of volcanic brimstone; *hear* the sound of surf, waves of molten lava’’ enhance the idyllic representation of the destination (Goss, 1993: 672).

The use of both imagery and text in the creation of idyllic tourism destinations employed by the promotional discourse is also apparent for destinations strongly affected by global climate change. In utilizing phrases such as ‘‘beautiful white sandy beaches (…) spectacular strip of beach (…) scenic views of the beautiful sandy white beach (…) it faces a picturesque long white sand beach strip’’, in referring to Playacar, Mexico, a destination severely affected by coastal erosion through climate change, the promotional discourse employs both imagery and textual components, as discussed by Goss (1993), to create specific and enhanced representations of tourism destinations (Buzinde *et al.,* 593). Thus, as Buzinde *et al.* (2010: 593) state, ‘‘the constructed discursive representations complemented the pictorial portrayals, albeit they obfuscated the dire state of the beach’’. Therefore, despite the evident transformation of physical space brought about by global climate change, the destination’s no-longer picturesque beaches are still being represented as idyllic and paradisiac by tourism promoters in brochures through the strategic use of both non-realistic imagery and textual components (Buzinde *et al.,* 2010). As such, in regard to destinations strongly affected by global climate change, the tourism industry seems to attempt to render certain components of the ever-changing landscape subliminal (Buzinde *et al.,* 2010: 589). Thus, images and representations portrayed in the promotional discourse may not be accurate nor realistic. While both Goss (1993) and Buzinde *et al.* (2010) have analyzed the use of the promotional discourse in framing representations and images of tourism destinations, neither have examined the intentions of tourism promoters on the creation of such representations through the promotional discourse. Conversely, Goldberg *et al.* (2018) undertook a study which provides insight on the latter at a destination severely affected by global climate change: the Great Barrier Reef.

2.3 Idyllic representations: a tourism operator's motivation?

The current literature pertaining to the promotional discourse in the frame of transforming landscapes through global climate change mostly addresses the conceptualization of utopic representations by tourism promoters (Buzinde *et al.,* 2010 and Buzinde *et al.,* 2010b). However, neither study provides insight into the promoters' motives in the creation of such representations. Indeed, Goss (1993: 664) states that his analysis can only provide an interpretation of the meaning of the promotional discourses used but not the intention of their producers. In directly addressing tourism operators on the GBR, Goldberg *et al.* (2018) provide a better understanding of the motives behind creating idyllic images and representations of tourism destinations under severe threats of global climate change, thus contributing to both Buzinde *et al.* (2010) and Goss' (1993) studies. While tourism operators are perfectly placed, both figuratively and literally, to deliver information on the GBR's outstanding universal value and messages relating to its conservation and management of threats (Goldberg *et al.,* 2018: 239), they also have significant interest in providing visitors and tourists with both satisfying and enjoyable experiences (Coghlan, 2012 in Goldberg *et al.,* 2018: 239). In being so perfectly placed to deliver such information, the tourism operators, and the tourism sector as a whole, both have the ability to take an active role in the de-marketing of certain products and experiences that can create negative environmental impacts (such as contributing to global climate change), thus exerting its buying power to influence suppliers (McKercher *et al.,* 2014: 687). However, with vested interests in the Reef's conservation as well

as in it being a successful tourism destination, tourism operators may have conflicting values and may end up valuing one over the other, thus potentially contributing to flawed representations of the GBR's image in their promotional discourses.

It is evident that while some GBR tourism operators interviewed have been shown to act in reducing their carbon footprint (Goldberg *et al.,* 2018: 240), thus reducing overall global climate change impacts, multiple tourism operators worldwide do not actively participate in addressing climate change in their businesses (McKercher *et al.,* 2014: 690). In fact, McKercher *et al.* (2014: 690) have shown that while senior managers, owners and operators within the tourism industry recognize that climate change is an important issue and believe that tourism is not only one of its main contributors but also has a role to play in its mitigation, none of those interviewed ''identified climate change as part of their broader corporate social responsibility activities''. Thus, many tourism operators avoid both personal and corporate responsibility in addressing and taking action for climate change and rather prefer to remain unaware or misinformed about the issue all while primarily focusing on product pushing and the tourism experience (McKercher *et al.,* 2014). Like McKercher *et al.*'s (2014) study, Goldberg *et al.* (2018: 240) have shown that in regard to tourism operators on the GBR itself, some have taken action to reduce their impacts on global climate change while others are simply driven by promoting their offered tourism experience. In fact, tourism numbers are a main concern for some tourism operators (Goldberg *et al.,* 2018: 252). As such, the latter therefore believe that providing climate change stories for the media will frighten guests, thus ultimately reducing overall tourism numbers (Goldberg *et al.,* 2018: 252).

Furthermore, Goldberg *et al.* (2018: 249) have shown that ‘‘some [interviewed tourism operators] were cautious about discussing negative topics with guests as they were concerned how these discussions would affect the tourism experience on the day. [Interviewed tourism operators] also feared that guests would misinterpret information and spread bad publicity about the [GBR] back home, negatively influencing the tourism industry by reducing visitor numbers and business revenue’’. While tourism operators on the GBR ‘‘accept the responsibility to provide trusted interpretation to their guests’’, they rather deliver positive and informative messages that can lead the visitor to have a positive tourism experience (Goldberg *et al.,* 2018: 250). These findings evidently show that the latter tourism operators are mainly concerned with the success of their businesses as opposed to the long-term effects of global climate change. Moreover, the idea that tourism operators do not necessarily understand the impacts and processes of global climate change is highlighted through the fact that those interviewed believed that climate change is a bigger threat to the GBR than it is to their personal tourism operations (Goldberg *et al.,* 2018: 250). Indeed, as Goldberg *et al.,* (2018: 250) state, ‘‘as a consequence of running a business that depends upon a healthy ecosystem, tourism operators are intimately intertwined with their surrounding environment. In that regard, there is no true separation of a threat to their business from a threat to the [GBR]’’. The overall ill-understanding and ultimate goal of having a successful tourism operation may therefore have significant impacts on how tourism operators on the GBR, and at any destination severely affected by global climatic impacts, create representations of said destinations through the promotional discourse. In being focused on increasing tourism numbers and revenue, promoters may want to create idyllic representations of said destinations as opposed to representations which highlight the ecosystem’s degrading ecological health, thus actively choosing to promote the destination in a healthier state than it is truly in to ultimately attract more tourists.

While tourism promoters may be hesitant in showing less ideal and more accurate representations of vanishing destinations in the fear of negatively impacting their businesses, it has been shown that the latter create green, sustainable and eco-friendly representations of their businesses in the promotional discourse (Zeppel, 2012: 291). Thus, some tourism operators use greening initiatives as a marketing tool (Zeppel, 2010: 291) and as states Hall (2019: 1050), ‘‘sustainability itself is positioned as an economic or competitive value rather than an ethical or environmental one’’. Tourism promoters may therefore paint their businesses as so since individuals are seemingly adopting new attitudes and responses to tourism as there is an increase in consensus about the need to act on climate change (Marshall *et al.,* 2011: 510). Thus, as Marshall *et al.* (2011: 510) announce, ‘‘a destination with a poor image for sustainability and climate friendliness could rapidly decline as a preferred destination with tourists with a strong environmental conscience’’. Such manipulation of business representations to satisfy tourists and to ensure successful business may also be employed in the manipulation of the destination’s image itself. In creating representations of the destination, tourism operators, through the promotional discourse, may be omitting the true ecological state of the site through the enhancement of images in the creation of idyllic and pristine representations. While government managerial agencies have vested interests in a natural heritage site’s economic use *and* ecological well-being, the managerial discourse may be one that therefore also presents idyllic representations of the ecosystem in addition to more accurate representations of the same ecosystem.

2.4 Management: stuck in the middle?

Goldberg *et al.* (2018: 253) recognize that the identification of both the key messages and the method of message delivery are the necessary first steps in addressing climate change and tourism. Further, ‘‘[r]esource managers are encouraged to closely collaborate with tourism operators regarding the development and implementation of climate change messaging. A unified message delivered across the GBR tourism industry, in collaboration with its management agencies and other stakeholders, would help build solidarity among operators while concurrently prioritizing and perpetuating key points to tourists, potentially influencing their attitudes and behaviours’’ (Goldberg *et al.,* 2018: 253). As mention Goldberg *et al.* (2018: 253), *management* must collaborate with other stakeholders regarding climate change messaging. However, in addressing *worldmaking* within the specific realm of tourism studies, Hollinshead (2009: 643) suggests that it encompasses the promotional activities of management agencies, amongst other stakeholders, in creating often false representations through privileging certain dominant representations of peoples/places/pasts/ideas within a certain area over other potential representations of those subjects. As a result, Hollinshead and Suleman (2018: 204) argue that the tourism industry, in which management agencies play a critical role, participates in the fabrication of representations of spaces, which are not a true mirrored reflection of the actual given space. Ultimately, these authors argue that a discourse plays a crucial role in the construction of representations of a given space and further highlight that there may often exist disparities between representations from various discourses of one given space or *world*.

While there exists no literature, to the author's knowledge, on the creation of various representations of a singular tourism destination by the managerial discourse, scientific literature contains a plethora of articles which analyze and discuss the many approaches to the management of parks and protected areas with focus in recreation and tourism services. In fact, Graham *et al.* (2003 in Eagles, 2009: 232) have suggested four different governance models for protected areas which include government management, multi-stakeholder management, private management, and traditional community management. Regardless of the model, the latter involves, in most cases, some form of partnership (Eagles, 2009: 232). Importantly, however, different stakeholders may have different and/or conflicting priorities (Murray, 2021). In fact, as suggests Murray (2021) in particular reference to marine protected areas (MPAs) in Belize, "[i]t is increasingly important for MPAs to have effective governance to achieve their objectives and mitigate the impacts from anthropogenic and climate change stressors. There are significant challenges with [the three studied MPA governance models] fundamentally stemming from a lack of political will, poor community inclusion and a disproportionate focus on economic development through tourism and fish exports", therefore highlighting the idea that conflicting priorities amongst stakeholders may result in poor governance from the ecological conservation perspective in instances where economic development is favoured.

In combining the idea that management agencies have the ability to create specific representations of a given environment through worldmaking with the idea that governance of natural heritage sites often entails partnerships and multi-tiered governance systems where different stakeholders may have different (and oftentimes conflicting) priorities (Murray, 2021), it may be argued that

managerial discourses may create various representations of a singular environment to sustain these partnerships and their associated multiple vested interests. In turn, these various representations may highlight the management discourse's conflicting interests, where that of economic gain may be prioritized, therefore resulting in less than ideal ecological conservation practices and outcomes. As such, the representations of a given natural heritage site, especially one under severe threats from climate change, may vary across discourses but may also vary *within* discourses.

2.5 Different discourses, different representations, same destination

As of yet, the ecological scientific discourse is not often discussed or analyzed in tourism literature pertaining to climate change and its impacts. However, one of the few aspects of the ecological discourse that is discussed and investigated in tourism literature is the ecological and global climate change impacts of airplane travel and long-haul destination travel. Indeed, authors like Burns and Bibbins (2009) have analyzed the various discourses pertaining to global climate change through airplane travel and tourism communicated by different parties. In comparing discourses from the media to discourses communicated by policy makers, government, independent organizations and social movements, Burns and Bibbins (2009: 94) have shown that there are conflicting debates and various narratives associated with the impacts of air travel and climate change. Furthermore, both Gössling and Peeters (2015) and Lenzen *et al.* (2018) have conducted in-depth studies on the impacts of tourism on increased greenhouse gas emissions and global climate change. However,

the above-mentioned literature discusses the role tourism plays on increasing the effects of climate change rather than analyzing how climate change alters tourism destinations and how the discourses related to those specific environments frame representations and images of the destinations. Indeed, very little literature has compared the ecological state of tourism destinations, herein referred to as the ecological scientific discourse, to representations and images of the destination employed through marketing, herein referred to as the promotional discourse.

Both Goldberg *et al.* (2018) and Buzinde *et al.* (2010) make references to the ecological state of each tourism destination analyzed in their studies. Indeed, throughout their study, Goldberg *et al.* (2018) make several references to the ecological scientific discourse to discuss the GBR's true ecological state. In doing so, Goldberg *et al.* (2018) touch upon the Reef's vulnerability to environmental alterations, increased prevalence of coral disease and the projected impacts increased global temperatures will have on the Reef in terms of its ecological state, alterations in coral growth and the biodiversity of marine species. Similarly, Buzinde *et al.* (2010) also refer to the ecological scientific discourse to emphasize Playacar's overall ecological state. Thus, discussions of the effects of global climate change on beach erosion and increased frequencies of intense tropical storms are undertaken to highlight the ways in which climate change impacts coastal landscapes throughout the Caribbean and specifically at Playacar (Buzinde *et al.*, 2010). While it is evident that both authors make reference to the ecological scientific discourse in order to discuss the ecological state of their studied tourism destinations, neither delve into the topic of comparing the ecological scientific discourse to the promotional discourse to analyze how either

discourse frames representations of tourism destinations. Rather, the ecological scientific discourse is skimmed to provide a summary of the ecological state of the studied destinations.

While the author of this paper considers the ecological scientific discourse to frame accurate representations of a destination, Buzinde *et al.* (2010) consider a different approach. Rather than utilizing the ecological scientific discourse as a depiction of a destination's realistic state, Buzinde *et al.* (2010) use the tourist discourse on Trip Advisor. Therefore, in this case, Buzinde *et al.* (2010: 583) state that ''tourists reflect on industry productions, their own experiences and perceptions, and thus, proceed to post accounts that support or negate the portrayals constructed by tourism promoters. (…) In fact, sites such as Trip Advisor are becoming increasingly important locations within which dialogic processes between tourists and promoters occur as both vie for meaning''. Through the usage of these online forums, tourists have the power to not only challenge but also negate tourism promoters' idyllic and pristine representations of specific tourism destinations (Buzinde *et al.,* 2010). As such, while tourism promoters construct destination representations according to specific marketing criteria (Buzinde *et al.,* 2010: 583), often involving enhanced and idealized representations (Goss, 1993), tourists have the ability to co-construct the latter (Buzinde *et al.,* 2010).

Buzinde *et al.* (2010: 583) therefore suggest that,

> ‘‘[c]o-construction occurs when the tourist plays an active and effective discursive role in this production [of destination representation] process. Traditionally tourists have played a passive role in the production process and therefore co-construction has been largely absent. In this context, promoters have tended to assume that tourists will decode essentialist portrayals by uncritically adopting dominant frames (e.g., pristine beach environments). However, empowered tourists might co-construct these frames by acquiescing, negating or negotiating them’’ (Buzinde *et al.*, 2010: 583).

In this circumstance, tourists, through the use of online platforms, create more accurate representations of the tourism destination in comparison to those created and communicated by the promotional discourse. It is therefore evident that the promotional discourse surrounding climate change affected tourism destinations create idyllic representations and images despite the deteriorating state of the environment. As such, tourism promoters who are afraid of communicating negative images and the dire state of vanishing destinations, as discussed by Goldberg *et al.* (2018), would rather depict the destination as idyllic and pristine. Such strategies employed by tourism promoters through the promotional discourse therefore strongly resemble those discussed by Goss (1993). In employing such strategies to paint perfect representations and images of destinations affected by climate change, it is obvious that the promotional discourse communicates a different narrative than what is present in real-time. While real-time representations can be accurately painted by the ecological state of an environment, we can therefore deduce that the promotional discourse creates vastly different representations than does the ecological scientific discourse. Moreover, the two discourses may compete in their framing of representations as the tourism industry seems to be mainly focused on increasing revenue whereas the ecological scientific discourse is seemingly concerned with the sustainability and conservation of the particular site. This is especially apparent through the promotional discourse’s recent use of

last chance tourism as a means to promote the touristification of destinations undergoing severe degradation due to the effects of climate change, as is the GBR.

2.6 Last chance tourism: commodification disguised as conservation

The concept of last chance tourism is one that is often defined in the literature but is not always consistent in its definition. First, Dawson *et al.* (2011) define last chance tourism as the tourists' desire to see vulnerable environments which may be subject to disappearing or to being inevitably transformed as a result of anthropogenic climate change. Lemelin *et al.* (2010), however, define last chance tourism as the tourists' desire to see landscapes and species before their disappearance. Despite the fact that Lemelin *et al.* (2010) do not specifically mention anthropogenic climate change in their definition of last chance tourism, the authors analyse the disappearance of landscapes and species brought on by anthropogenic climate change. The concept of last chance tourism is further addressed by Piggot-McKellar and McNamara (2017). These authors define the concept of last chance tourism as ''tourists explicitly seek[ing] vanishing landscapes or seascapes and/or disappearing natural and/or social heritage'' (Piggott-McKellar and McNamara, 2017: 398). These various definitions of the concept demonstrate that there is little consensus as to what the tourists seek to visit (natural environments but also social constructs) or how/why these elements are endangered and disappearing. For the purpose of this study, the author therefore suggests the

following definition of the concept of last chance tourism: tourists' travel to see endangered phenomenon.

The concept of last chance tourism is one that has recently become increasingly popular in the promotional discourse pertaining to climate change affected tourism destinations (Carvalho and Loose, 2018: 123). However, the use of last chance tourism by the promotional discourse creates representations that are far from the idyllic, pristine and paradisiac ones defined by Goss (1993). In comparison to the textual and imagery components usually employed in the tourism promotional discourse thoroughly described by Goss (1993), it is evident that last chance tourism has a negative connotation. As a result, the image painted by the promotional discourse when using the argument of last chance tourism may not be as much of an idyllic representation as the promotional discourse used to paint before this concept was employed. While the concept of last chance tourism has only been used since approximately the year 2007, it can be argued that the creation of less than idyllic and pristine representations of tourism destinations is a recent shift from the promotional discourse. However, the use of last chance tourism in the promotional discourse is but a textual component. As of yet, very little academic literature has analyzed the images accompanying the textual reference of last chance tourism in the promotional discourse to see whether the visual and textual components go hand in hand or if the images presented alongside the textual reference are idyllic and pristine, thus contradicting the textual components entirely. In one particular study undertaken by Carvalho and Loose (2018), the authors analyzed 12 last-chance travel lists to answer the following question: ''[h]ow do images and linguistic text in these lists interact to convey information about climate change?''. Importantly, Carvalho and Loose (2018) use the case study

of the GBR. Throughout their study, Carvalho and Loose (2018: 133) mention that the Australian Institute was able to identify 2,887 published media articles containing references to both the GBR and coral bleaching between January 1st and June 1st, 2016, which the authors argue will motivate some people to see the ecosystem before it deteriorates while dissuading others by the news of its degradation. Moreover, out of the 12 lists, eight entries refer to climate change as a threat to the GBR, one refers to the dual threats of climate change and tourism, and a single entry presents tourism as the major threat to the GBR (Carvalho and Loose, 2018: 134). In particular, the *EscapeHere* list made an entry telling readers that they can solve their ‘‘moral quandary’’ by visiting the GBR in an environmentally sensitive way and contributing to the conservancy groups that are fighting to save the ecosystem (Carvalho and Loose, 2018: 134). In essence, the authors show that these various last chance tourism lists convey the message, in using textual and linguistic methods, that the GBR is undeniably under severe ecological threat due to climate change. However, in comparing the textual/linguistic components to images published and communicated by these last chance tourism lists, Carvalho and Loose (2018: 135-136) reveal that only a single image used ‘‘could be interpreted as possibly illustrating climate change impacts, and this was a photograph of a turtle swimming above colourless coral’’. Carvalho and Loose (2018: 136) therefore state that last chance travel lists identified in their study construct tourism destinations as problems and products for readers and position the readers first and foremost as consumers through the use of images that create representations of the destination as pristine, idyllic and desirable. The authors thus state ‘‘[i]n our sample, dire linguistic predictions of disappearing global treasures were likely to be accompanied by beautiful images of what could yet be saved by individuals, industry and governments acting responsibly. However, most of these images had already been commodified and it seems likely their polysemous potential to position audiences as members of transnational publics was curtailed by headline calls to action entreating tourists to consume in

haste'' (Carvalho and Loose, 2018: 136). As such, Carvalho and Loose (2018) conclude in suggesting that last chance tourism destinations are pushed as products to consume through both textual/linguistic and image representations of the destination itself. Thus, destinations severely affected by global climate change are seemingly commodified by the tourism industry, where some of this commodification even promotes the ecological conservation of the destination.

The idea that last chance tourism can promote ecological conservation through the commodification of nature is one that has been largely discussed in scientific literature. Indeed, Lemelin *et al.* (2010: 478) suggest that the promotion of last chance tourism at a specific destination has the ability to help raise awareness and visibility of a particular problem and may, in some instances, lead to the promotion of conservation efforts. Similarly, Piggott-McKellar and McNamara (2017: 398) have shown that the GBR has been discussed and labelled as a last chance tourism destination within academic literature, in various travel websites and magazines, including TIME magazine, and throughout the media. One example of the latter is the publishing by Qantas Airlines on how to conserve the GBR now that it has attained the last chance destination status (Piggott-McKellar and McNamara, 2017: 398). Furthermore, the concept of last chance tourism employed by the promotional discourse is one that is underlyingly focused on the commodification of nature, thus advocating in favour of the capitalist system. In fact, Fletcher (2019: 522) has stated that the strategy of last chance tourism is to ''harness this ''end of nature'' itself as a novel tourism ''product''. If the Anthropocene is better understood as the Capitalocene, as some contend, then this strategy can be viewed as a paradigmatic example of disaster capitalism in which crises precipitated by capitalist processes [, such as crises pertaining to the increase of greenhouse gas

emissions and global climate change,] are themselves exploited as new forms of accumulation''. Further, Fletcher (2019: 522) argues that experiences of last chance tourism become ''less about getting in touch with a spectacular ''nature'', as in the past, than of experiencing the *loss* of this nature in the face of human-induced change [such as through anthropogenic climate change]''. Thus, Fletcher (2019: 523) suggests that Anthropocene tourism can be described as a form of disaster capitalism which seeks to transform the threats posed by anthropogenic changes, such as climate change, into opportunities for the expansion of the tourism industry. In this context, the global tourism industry is arguably the world's most effective and creative form of disaster capitalism, where the various problems created by development of capitalist nature are taken and turned into new products and experiences for the consumption of tourists (Fletcher, 2019: 526). Specifically, ecotourism and nature tourism, categories in which the various tourism experiences and products offered on the GBR fall into, can be seen as niche forms of disaster capitalism where neoliberal practices create the privatization of markets and the commodification of natural resources and ecosystems in order to provide an environmental fix (Castree, 2008 in Fletcher, 2019: 527) for the ecological damage caused by capitalist development (Fletcher, 2019: 527). Thus, it is in this context that the tourism industry can take situations of environmental degradation brought on by industrial capitalism and transform them into opportunities (Fletcher, 2019: 531) which allows for the industry's further growth and accumulation of capital. As such, it is evident that the tourism industry can make use of the negative connotation implied with last chance tourism in order to promote an increase in capitalistic gains through the use of linguistic and textual components mentioning last chance tourism in combination with idyllic and pristine imagery.

2.7 The co-evolution of discourses: a competitive edge

While it is evident that ‘‘last chance’’ has a negative connotation when referring to an environment’s ecological state, this term may be evoked by the promotional discourse as a means to adapt to the images of degrading tourism sites painted by the scientific ecological discourse to popularize a given environment as a tourism destination. The recent angle of last chance tourism adopted by the promotional discourse can be viewed as a direct result of the competition between the promotional and scientific ecological discourses. While the ecological discourse paints a negative and degrading image of ecosystems undergoing alterations due to the effects of climate change, the promotional discourse’s once pristine and idyllic representation of said ecosystems are now often being presented as last chance tourism destinations. As a result, the degraded representation of ecosystems affected by climate change (such as that of the GBR) painted by the scientific ecological discourse, may be used by the promotional discourse as a means to strategically promote increased tourism of such sites through the last-chance tourism or disaster tourism narrative. The ecological discourse may therefore be fueling the promotional discourse’s narrative of last chance or disaster tourism. Thus, using the image painted by the ecological scientific discourse may have resulted in the promotional discourse gaining a competitive edge in promoting last chance or disaster tourism which undoubtedly equates to the promotion of the neoliberal commodification of nature and the capitalist system. In turn, given that the heritage site’s management maintains important partnerships with both tourism operators and scientific (conservation) researchers, the managerial discourse may utilize both the scientific ecological

discourse and the tourism discourse to its advantage. In this sense, the competition between all three discourses may be better understood through evoking the Red Queen Hypothesis.

Van Valen's Red Queen Hypothesis was paramount in emphasizing the importance of biotic interactions in driving evolution where "[b]iotic forces provide the basis for a self driving perpetual motion of the effective environment and so of the evolution of the species affected by it (Van Valen, 1973 in Brockhurst *et al.,* 2014: 1). Furthermore,

> "because abiotic environments commonly change slowly with respect to the inhabiting organisms, evolution was thought to slow to a halt as the optimal phenotype is reached, recommencing only when conditions change. Biotic environments, by contrast, are themselves subject to evolution and so can change rapidly. According to the [Red Queen Hypothesis], each adaptation by a species is matched by conteracting adaptations in another interacting species, such that perpetual evolutionary change is required for existence" (Brockhurst *et al.,* 2014: 1).

In applying the Red Queen Hypothesis to the context of this study, the GBR can be compared to the biotic environment, constantly undergoing changes and evolving, all while the three discourses can be compared to adapting species, which must counteract each other's adaptations to survive. As such, the three discourses may depend on each other to drive competitive adaptation mechanisms through co-evolution as a means to survive.

CHAPTER 3
METHODOLOGY

3.1 Research objectives

This study's goal is to demonstrate the interactions between the managerial discourse, the tourism promotional discourse and the scientific discourse of a tourism destination severely affected by anthropogenic climate change. It is in this context that this study will show how the interaction between these three discourses creates a discursive environment of the destination in question, which ultimately affects its overall image and practices, where the latter are directly embedded within neoliberal commodification mechanisms. A methodological table (Appendix A), in which the main research question and sub-questions were inscribed, was used to help better focus research methods and analyses. In this table, not only were all sub-questions included, but specific research objectives, data sources, and methods of analysis were added for each individual question. This table could therefore help determine which types of actors needed to be targeted and which research method was needed for data collection and analysis pertaining to each sub-question. Overall, the methodological table served as an overarching guideline to the study.

3.2 Ontological and epistemological positioning

One's ontological position pertains to how the world is perceived. The relativism constructivism position is based on the idea that there are multiple realities which subsequently depend on the experienced context. Thus, according to this ontological position, reality evolves and changes according to lived experiences. As such, realities exist through various mental states and constructions, where the shape of these realities is entirely dependent on one's experience. This idea can be better understood through the concept of social representations in tourism. As suggests Moscovici (1984 in Sarr *et al.* 2020: 3) social representations

> are generated through two processes: anchoring and objectification. Anchoring reduces strange ideas to ordinary categories and images and set them in a familiar context to make sense of them. Objectification turns an abstract idea into something almost concrete and thereby transfers something in the mind's eye to something existing in the physical world (Moscovici, 1984 in Sarr *et al.*, 2020: 3).

As such, Sarr *et al.* (2020: 3) suggest that the processes of anchoring and objectification may undoubtedly intervene in the construction of realities related to both tourism and tourists for people who possess cultural identities that differ from the dominant group. For people possessing such cultural identities, tourism and tourists may be an unfamiliar social phenomenon which can be explained by their social constructions of reality and immediate cognitive backgrounds (Sarr *et al.* 2020: 3). Thus, it becomes evidently clear that an individual's experiences play an active role in shaping their representations and ideologies of a given concept, phenomenon or

space.‘‘Constructivists claim that truth is relative and that it is dependent on one’s perspective (Baxter and Jack, 2008: 545). The constructivist paradigm “recognizes the importance of the subjective human creation of meaning, but doesn’t reject outright some notion of objectivity” (Crabtree and Miller, 1999: 10 in Baxter and Jack, 2008: 545). The researcher’s ontological position is therefore one of constructivism as this research consists of interpreting how the ecological, promotional and managerial discourses illustrate the GBR’s biological health status. In addition, this research attempts to investigate how these representations of the GBR influence practices of tourists who choose the GBR as a tourism destination and of tour operators on the GBR. As a result, the researcher believes that there are various different perceptions and representations of the GBR and that the latter are a result of a construct of experiences and contexts, which in turn can evolve and change through time and space. Thus, the research object is a social construct made up of signs and representations.

On another hand, epistemology addresses the process by which an individual understands the world. The researcher’s epistemological position is of the socioconstructivism interpretation paradigm. The latter is based on the idea that there are multiple realities, which in turn must be interpreted in order to reveal their nature. In this study, the interaction with literature and data pertaining to each discourse is needed to understand each of their realities facing the situation at hand. As a result, the established knowledge will be constructed through the interaction between the author’s subjectivity and the interpretations of the literature, and the research object. Here, it is crucial to mention that discourses play an active role in not only the construction of representations, but also in their

practice. This idea can be directly inscribed in Goodman's (1978) concept of *worldmaking*, as addressed previously.

3.3 Case study

This research utilizes a single case study to facilitate data collection, data analysis and transcription, in accordance with specific budget and time allocations. As state Baxter and Jack (2008: 545) in reference to Yin's (2003) work,

> a case study design should be considered when: (a) the focus of the study is to answer "how" and "why" questions; (b) you cannot manipulate the behaviour of those involved in the study; (c) you want to cover contextual conditions because you believe they are relevant to the phenomenon under study; or (d) the boundaries are not clear between the phenomenon and context (Yin, 2003).

While this study's main research question pertains to understanding how the promotional, managerial, and ecological discourses contribute to the construction of tourism destination images affected by climate change in order to create specific representations, it is clear that the first criterion (a) is met. Furthermore, this study does not seek to manipulate the behaviour of those involved in the study, but rather understand them. Finally, this study must cover contextual

conditions as they are relevant to the phenomenon of different discourses creating different representations of a destination severely affected by climate change where there exists no specific nor clear boundaries between phenomenon and context. Importantly, the specific phenomenon may be applicable to different contexts. In analysing the ways in which the three different discourses paint and further construct images of the GBR while being severely ecologically affected by anthropogenic climate change, the research will give a clearer understanding of how and why these various representations differ or are similar, and in turn how they can contribute to an adaptive competitive process between discourses. The interconnections, interrelations, and competition between the three discourses as a result of the effects of anthropogenic climate change on a tourism destination can only be truly understood by applying the study within a specific reality. In fact, as suggests Yin (2014: 52). "[h]ere, the objective is to capture the circumstances and conditions of an everyday situation – again because of the lessons it might provide about the social processes related to some theoretical interest". Thus, to answer the research question at hand, the case study methodology is not only appropriate, but rather highly beneficial.

While this research methodology is one of a case study, it is more so specifically falls into the category of an instrumental case study. Baxter and Jack (2008: 549) suggest that the instrumental case study's role:

> [i]s used to accomplish something other than understanding a particular situation. It provides insight into an issue or helps to refine a theory. The case is of secondary interest; it plays a supportive role, facilitating our understanding of something else. The

> case is often looked at in depth, its contexts scrutinized, its ordinary activities detailed, and because it helps the researcher pursue the external interest (Baxter and Jack, 2008: 549).

Thus, while this research utilizes the case study of the GBR, the researcher's interest lies beyond the particular case of the GBR. In other words, the GBR provides an excellent microcosm of events, processes and scenarios that through its utilization, will provide greater insight into the research question. The use of the GBR as a case study therefore provides insight into phenomena which can be applied to various other destinations globally.

3.4 Choice of case study

According to Yin (2013) all research involving a case study methodology requires a definition and delimitation of the case. Indeed, a case is defined by Miles and Huberman (1994: 25) as "a phenomenon of some sort occurring in a bounded context. The case is, in effect, your unit of analysis" (in Baxter and Jack, 2008: 545). Within the context of this study, the case chosen to analyze the ways in which the ecological discourse, the promotional discourse and the managerial discourse paint images and representation of a tourism destination severely affected by anthropogenic climate change is a community of actors working with/for the tourism industry of the GBR and/or scientists/authors having published or working on publications within the scientific

literature realm, discussing the ecological/biological health status of the GBR in reference to anthropogenic climate change. Importantly, this group of actors includes those working directly as tourism operators and DMOs in addition to governing bodies such as the GBRMPA given that the latter publish documents and obtain a discourse which references both the GBR's tourism industry *and* its ecological/biological health status in reference to anthropogenic climate change.

While the GBR, being the largest reef ecosystem globally, stretches over 2,300 kilometers and consists of an area of approximately 344,400 square kilometers, tourism activities are concentrated on approximately seven percent of the total region (GBRMPA, 2019: 112). Moreover, 86% of tourism within the GBR region takes place within the waters adjacent to Cairns, Port Douglas and the Whitsundays, which are concentrated on tourism pontoons and popular beaches & islands (GBRMPA, 2019: 112). As a result, collected data for the tourism discourse will likely target the above-mentioned three areas. Since the GBR is an internationally popular tourism destination *in addition* to being one of the most vulnerable ecosystems to the effects of climate change, its use as a case study is extremely pertinent to better understand the ways in which discourses adapt the ways a destination affected by climate change is represented. Indeed, being such a popular tourism destination, tourism activities within the GBR region is responsible for generating $2.4 billion (value-added) for Catchment communities (GBRMPA, 2019: 113). In addition, the Reef is an important attribute to the wellbeing of local communities, especially including Indigenous communities (Marshall, 2019) and is an important ecosystem included in one of the top biodiversity hotspots globally. As such, the effects of anthropogenic climate change resulting in poor ecosystem

health and accelerated deterioration of the environment will cause serious biological, ecological, social and economic outcomes.

The choice of utilizing the GBR as a case study was made as the collectivity of tourism operators, scientists and managerial organizations all seem aware of the severe impacts of anthropogenic climate change on the ecosystem. However, despite their awareness, the different groups of actors all seem to create different representations of the GBR. The research therefore targets the GBR as a case study to further analyze this initial observation. In addition, the GBR was also chosen as the case study for this research due to the fact that its decline in ecological and biological health has been well documented, and has also gained global popularity, in various forms pertaining to the three targeted discourses.

3.5 Mixed qualitative-quantitative method

This research uses a mixed method where both quantitative and qualitative data are used (Appendix A). Indeed, case study research permits the use of various data sources which in turn enhances data credibility (Yin, 2003 in Baxter and Jack, 2008: 554). As suggest Baxter and Jack (2008: 554), "[u]nique in comparison to other qualitative approaches, within case study research, investigators can collect and integrate quantitative survey data, which facilitates reaching a holistic

understanding of the phenomenon being studied". Thus, this study utilizes the qualitative data obtained from various sources which comprise of, literature and brochure findings. The quantitative data, however, is obtained from word queries undertaken in NVivo. Both the qualitative and quantitative data contribute significantly to the understanding of the phenomenon (Baxter and Jack, 2008: 554) of the GBR's case study pertaining to the destination's changing image through various discourses as a result of anthropogenic climate change. The use of various types of data therefore adds strengths to the findings, which in turn promotes a better understanding of the case at hand (Baxter and Jack, 2008: 554).

3.6 Data collection and sampling method

Samples for the tourism discourse for this research are made up of promotional material (including brochures, pamphlets and online website material) from various tourism organizations and DMOs within the GBR region (Appendix B). The sample of GBR tourism operator websites used for the study was drafted according to the list of current permit holders provided through the Great Barrier Reef Marine Park Authority – GBRMPA Permit Enquiry webpage (secure.gbrmpa.gov.au/ENQEXT/). Importantly, utilized search criteria to compose the list of GBR tourism operator websites used for the study included ''Permit Status: Current'', and ''Permission Type: Conducting a tourist program''. The study also included information published on websites of Regional DMOs such as Tourism Australia, Tourism Queensland and Tourism Tropical North

Queensland. Importantly, all samples from DMOs and tourism operator websites comprise the tourism discourse (Appendix B).

Next, samples for the analysis of the managerial discourse consist of material published by the GBRMPA, the GBR's managing agency. As such, the samples making up the managerial discourse were sourced from the GBRMPA website and the 2019 Great Barrier Reef Outlook Report.

Furthermore, samples for the scientific discourse consist of scientific literature published by non-GBRMPA agencies and organisations such as those published through universities (James Cook University, University of New South Wales, etc.) and scientific literature published by government organisations such as the Australian Institute of Marine Science (AIMS), and the Commonwealth Scientific and Industrial Research Organization (CSIRO).

The collection of material pertaining to the scientific discourse through published scientific literature was completed using the advanced search criteria within the Université du Québec à Montréal (UQÀM) online library. First, within the UQAM online library, a preliminary search of all scientific articles including ''Great Barrier Reef'', ''climate change'' and ''ecology'' published between 2016 and 2022 rendered 362 articles. All articles were used in NVivo queries to identify themes and frequency of words used. Out of the 362 articles, a second subset was created based on similar themes found within the tourism and managerial discourses. The latter subset consisted of

52 articles in which colour, pristine, beauty, and climate change were discussed. Finally, the 52 articles were individually scrutinized to ensure that both ‘‘Great Barrier Reef’’ and ‘‘climate’’ were included within the literature and that the GBR was the primary location of study. Out of the 52 articles, 19 corresponded to appropriate themes (mentioning colour, pristine, beauty, and/or climate change) and were undertaken on the GBR as the location of study. These 19 articles were then further used to provide the context of the scientific discourse through an in-depth literature review. Importantly, the year 2016 was chosen as a criterion as it was the year in which the GBR sustained a large amount of coral bleaching.

3.7 Content and discourse analyses

The analysis of the data collected from the scientific literature, promotional material and managerial published documents will require both content analysis and discourse analysis. While content and discourse analysis are similar as “[b]oth are concerned with drawing conclusions about some aspect of human communication from a carefully selected set of messages” (Nuendorf, 2004: 33), the way in which they do so is different. As states Nuendorf (2002 in Nuendorf 2004: 33), “[c]ontent analysis is a summarizing, quantitative analysis of messages that relies on the scientific method, including an observance of the standards of objectivity/inter-subjectivity, *a priori* design, reliability, validity, generalizability (with probability sampling from a defined population of messages), replicability, and hypothesis testing”. In addition, content analysis is limited to a focus

on messages but is not limited to a mere analysis of words, which is not the case for discourse analysis (Nuendorf, 2004: 34).

> Thus, [content analysis] may provide identification of the "pragmatic" contextual cues of crisis communication, while [discourse analysis] provides a more nuanced interpretation of their meaning. (…) Those using [discourse analysis] attempt to fully disclose their mediation (through rich discussion of all "backgroundings" – assumptions, epistemologies, etc.), while those using [content analysis] attempt to minimize their mediation (through adherence to the scientific method, including an aim toward intersubjectivity, if not objectivity) (Nuendorf, 2004: 34).

In addition, validity is paramount in discourse analysis whereas the latter is unconcerned with reliability, which is a stark difference between the discourse analysis and content analysis methodologies (Nuendorf, 2004: 34). Indeed, for content analysis, reliability is of the utmost importance to the point where measures that do not lead to an acceptable level of reliability must be omitted in further analyses (Nuendorf, 2004: 34). Moreover, while replicability is not a focus for discourse analysis, it is an important standard for content analysis (Nuendorf, 2004: 34).

Discourse analysis and content analysis differ further in terms of methodology measurement. For content analysis, measurement is "a coding scheme that is written out in great detail, with an accompanying coding form (or a set of dictionaries (word/concept lists) if the analysis is strictly of written text). In all cases, the coding instrumentation is established *a priori,* and the goal is to create a coding plan that is so carefully defined that virtually anyone, with sufficient training, can serve

as a reliable coder" (Nuendorf, 2004: 34). The use of a coding scheme and coding form as measurement tools is a stark difference between content analysis and discourse analysis. Indeed, for discourse analysis, the researcher(s) serve(s) as the measurement instrument (Nuendorf, 2004: 34). As a result, both the measures and the analyses depend entirely on the expertise and orientations of the researcher(s), which suggests that discourse analysis can be characterized as the combination between technique and perspective/assumptions and therefore a combination of method and epistemology (Nuendorf, 2004: 34). In contrast, with content analysis, the epistemology is simply an endorsement of the scientific method (Nuendorf, 2004: 34).

As such, this study will undoubtedly make use of both a coding scheme and a coding form, which will take place on NVivo to analyze the contents of samples pertaining to the first two sub-questions (Appendix A). Furthermore, commonalities and discrepancies between the three discourses will be highlighted through discourse analysis. Indeed, a cross-analysis between the three discourses will be undertaken as the study aims to understand the relationship between the similarities and discrepancies of the three discourses to better understand the ways in which they create representations of the ecosystem . As such, the cross-analysis between discourses will allow to showcase the coevolution of the three discourses . In retrospect, because the scientific and tourism discourses are of entirely different nature (where concepts and themes are treated differently), content analysis for each of these discourses will be first undertaken separately in a non-cross-analysis methodology. However, as the managerial discourse encompasses themes and content found within both the scientific and tourism discourses, a cross-analysis methodology was undertaken. The latter involved identifying common content found between the managerial

discourse & the scientific discourse, and further between the managerial discourse & the tourism discourse. A cross-analysis methodology was then undertaken to discern discourse analysis between the three discourses, where similar themes, content, language, and images were compared between discourses.

3.8 Analysis of the tourism discourse

To analyze the tourism discourse, NVivo 12 was used. Within NVivo, tourism operator websites and promotional material was first read in its entirety as a pre-treatment to uncover themes, thus comprising of a discourse analysis. Following the pre-treatment, coding was undertaken according to uncovered themes: climate change and conservation, GBR, overall image of the GBR, wording used, and tourism practices. Thus, by utilizing a coding-scheme, the latter comprises content analysis. First, a coding node was used to identify all climate change and conservation related information. Next, a second node called ‘‘Great Barrier Reef’’ was used to identify all information related to the GBR. This node was further subdivided into four sub-nodes which included Images Used, Overall Image of the GBR, Wording Used, and Tourism Practices. In turn, each of these sub-nodes were subdivided. The Images Used node was subdivided into Colourful, Dead or Dying (bleached), Fishing, Healthy or Vibrant, Landscape, Living (coral, animal, vegetation), Under Water, Undisturbed (no humans), With Humans/Tourism. Next, the Overall Image of the GBR node was further subdivided into Healthy and Not Healthy nodes. Moreover, the Wording Used

node was subdivided into Beauty-Related, Colour-Related, Defying the Media, Destruction/Threatened-Related, Educational, Living (animals, coral, vegetation), and More Realistic Wording. Finally, the Tourism Practices node was subdivided into Eco-Certification, Exclusive, Justification for Tourism, and New Type of Tour/Offering.

Importantly, the sub-nodes (Images Used, Overall Image of the GBR, Wording Used, and Tourism Practices) were created and coded upon a second analysis of the tourism operators' website content after having initially identified the major themes (climate change/conservation and GBR). Next, the sub-sub-nodes (Colourful, Dead or Dying/bleached, Fishing, Healthy or Vibrant, Landscape, Living, Under Water, Undisturbed, With Humans/Tourism, Healthy, Not Healthy, Beauty-Related, Colour-Related, Defying the Media, Destruction/Threatened-Related, Educational, More Realistic Wording, Eco-Certification, Exclusive, Justification for Tourism and New Type of Tour/Offering) were created and coded upon a third analysis of the website content. The three read-throughs of the entire sample ensured effective and accurate coding.

3.9 Analysis of the managerial discourse

Following the analysis of the tourism discourse, an analysis of the managerial discourse was undertaken with NVivo 12. Within NVivo, documents published by the managerial discourse on

their website (https://www2.gbrmpa.gov.au/) in addition to the management-published 2019 Great Barrier Reef Outlook Report, which is a document published every five years that examines the GBR's ecological health, pressures, and future to provide regular and reliable means of assessing reef ecological health and management (GBRMPA, 2023), were first read in full. Common themes and content found between the tourism discourse and the managerial discourse were utilized to complete a discourse analysis of the managerial discourse and further draw comparisons between the latter and the tourism discourse.

3.10 Analysis of the scientific discourse

Quantitative data in the form of word frequencies was obtained from the scientific discourse sample comprised of 362 peer-reviewed scientific articles by using NVivo 12. Word queries were used to identify the 500 most frequent words used within the scientific discourse. Importantly, the word query criteria used included stem words and words with minimum length of five letters. The most frequent words were then separated into two categories: words with positive connotations and words with negative connotations, where words with neither positive nor negative connotations were omitted. Once categorized, words with positive and negative connotations were analyzed through the Text Search Query function within NVivo 12 to provide accurate context with each associated word.

Next, in-depth content analysis was undertaken for 19 peer-reviewed scientific articles making up part of the scientific discourse. Importantly, this analysis consists of content analysis given that themes uncovered were based on the coding-scheme from the analysis of the tourism discourse. Indeed, these 19 articles were chosen based on the premise that they discussed themes found within the tourism discourse and further included the overarching topic of the GBR and climate. Furthermore, all 19 articles were of studies directly undertaken on the GBR as a study location given that this study is particularly interested in the specific images and representations of the GBR created by the three discourses in question. An in-depth literature review of the 19-article subset of the scientific discourse was then utilized to provide an overarching view of the content found within the scientific discourse as a whole.

3.11 Image analysis

Given their prevalence in the tourism and managerial discourses, and the lackthereof in the scientific discourse, only images within the tourism and managerial discourses were analyzed. As suggest Byrne *et al.* (2022: 799) a benefit of utilizing photos as data is that the latter allow for researchers to investigate phenomena in their natural setting. As such, images underwent content and thematic analyses through NVivo 12 where "[c]ontent analysis start[ed] by cataloguing and assigning detailed descriptions to an intitial observation'' (Byrne *et al.,* 2022: 801). Moreover, as each new photo was analyzed, the researcher "merge[d] overlapping codes and subdivide[d] others to reflect distinctive patterns (…). Thus, the process involve[d] constant emergence and refinement of the codes" (Byrne *et al.,* 2022: 801). The images were therefore all coded as "Images used" upon the initial content analysis of both the tourism and managerial discourses. Next, images were coded based on thematic patterns which include: Colourful, Dead/Dying (bleached), Fishing,

Healthy/Vibrant, Landscape, Living (coral, animals, vegetation), Under Water, Undisturbed (no humans/tourism presence), Displaying Humans/Tourism.

3.12 Cross-discourse analysis

Once all three discourses were analyzed in terms of content, a cross-discourse analysis was undertaken. As such, a cross-discourse analysis was undertaken where the latter involved comparing common themes, ideas, images, and wording between the three discourses. The analyzed themes comprised of abundance, colour, geographic scale, beauty, and presence of marine and terrestrial life. Importantly, despite the three discourses being so seemingly different in nature, common themes were present in all three discourses. Undertaking a cross-discourse analysis based on common themes allows to further highlight how each of the discourses utilizes a common theme, within the singular location of the GBR, so differently. As such, a cross-discourse analysis where common themes within one given tourism destination are evaluated is strategically utilized to further depict how the three discourses differ.

3.13 Analytical approach

This study uses both the ecological and semantic approaches. In order to better understand the ecological scientific discourse, it must be analysed utilizing an ecological approach. The latter is especially based on the relationship between balance, adaptability, organisms and the environment, known as the goodness-of-fit in ecology. In utilizing ecological concepts, theories and paradigms, the study will unveil the message(s) invoked by the ecological discourse pertaining to the GBR's health status.

Furthermore, the semantic approach will be used to analyse the messages and representations convoked by the promotional discourse pertaining to the GBR's health and ecological status. While Uzzell (1984) utilized the semantic approach to analyse photos used in tourism brochures, the latter indicates that the semantic approach is useful in analysing the representations of tourism destinations in brochures and media because they make sense in the culture in which they are engrained. Thus, the semantic approach allows for a better understanding of the promotional discourse through analysing the different significations of their various components. In making use of this approach, the research can better analyse the messages convoked by the promotional discourse. As describes Echtner (1999), the semantic approach can help understand how objects and individuals can be used in the promotional discourse to symbolise aestheticism, which is pertinent to the specific case of the GBR.

3.14 Reliability and validity

According to Shkedi (2011, in Avraham and Ketter, 2017), establishing the reliability and validity of the qualitative analysis process requires making the empirical materials used for the study readily available, disclosing the analysis notes used throughout the research and integrating many quotations in the results section as a means to allow transparency of the analysis work. As such, ‘‘[t]his will allow readers to judge for themselves the quality of the analysis and verify the study’s reliability and validity’’ (Avraham and Ketter, 2017: 711). To meet these guidelines, the study’s methodology section includes the complete list of Tour Operators whose websites were analyzed, and the results section includes a plethora of quotations, which in turn provides transparency of the analysis (Avraham and Ketter, 2017: 712).

3.15 Study limitations

First, replication in social science research cannot always be achieved. However, while exact replication may not be feasible, it is important to note that if the exact same method was employed, similar results would be found. The latter can mostly be attributed to the fact that while the researcher of this study undertook methods to gather extensive material, whether it be promotional material or literary based material, to provide an accurate and intensive analysis of all three discourses studied, an exhaustive analysis of the latter is impossible within the time and financial

constraints in which this research was undertaken. Thus, further gathering of material pertaining to the three studied discourses is possible which may in turn alternate results.

In addition, as mention Fortin and Gagnon (2016: 263), nonprobability sampling methods include an important limitation due to the fact that the sample may not necessarily represent the targeted population. The latter is true since each individual element within the population does not have an equal chance to be a part of the sample. In addition, nonprobability samples are made without their comprising elements or individuals be obtained randomly (Fortin and Gagnon, 2016: 263). This sampling method also limits the researcher's capability of generalizing the study's results to a population other than the sample used (Fortin and Gagnon, 2016: 263). However, due to the Covid-19 pandemic, the researcher was not able to make his way to the study destination. While being on the field may contribute to the validation of the analysed discourses through their material presentation, the fact that the researcher undertook all analyses and collection of data may be desirable. Indeed, the researcher's physical distance to the study site also entails an emotional distance to the destination, its actors and all collected data. Thus, while subjectivity is an important limitation, the latter point contributes to a decrease in subjectivity and thus an increase in objectivity. In addition, while this research ultimately pertains to the ways in which anthropogenic climate change can negatively affect a tourism destination's ecological health status, the researcher thought it important to take all measures to reduce his own ecological footprint within the context of the given study.

The researcher's inability to make his way to the study destination brings about another important limitation to the study, where the latter involves the inability to evoke the dimensions associated with the Indigenous discourse on the GBR. As states the GBMPA (2019: 91) "[m]any traditional cultural practices include plants, animals and places. In this way, the condition of natural components of the Region are inseparable from Indigenous cultural identity". Importantly, a major component of the Indigenous discourse is traditionally comprised of oral communications, which are extremely difficult to analyze at a distance. In fact, Indigenous heritage is biocultural therefore meaning that heritage is dependent on biological resources, tradition and knowledge, all while encompassing both the environment and intangible components (GBRMPA, 2019: 92). In particular to the GBR, "[c]ultural practices, observances, customs and lore are aspects of Indigenous heritage values that are passed down from generation to generation, (…) This component includes skills, folklore, rituals, religious beliefs and intellectual traditions" (GBRMPA, 2019: 92), many of which include an oral component. Furthermore, knowledge of the environment in addition to the importance and responsibility to maintain the environment and all living species is passed down through generations in the form of stories, totems, songs and languages (GBRMPA, 2019: 92). As such, the latter, in combination with an understanding of their trend and condition, form a component of the knowledge held by Traditional Owners on the GBR (GBRMPA, 2019: 92), which yet again focuses heavily on oral communications. Finally, while sacred sites and places of cultural traditions are tangible components of Indigenous heritage values on the GBR, their locations are not well known outside of Traditional Owners as a means to respect traditions and protect the sites (GBRMPA, 2019: 93). As such, while the Indigenous discourse is one that is paramount in the discussion of climate change, tourism, and ecological conservation on the GBR, the researcher's distance to the study location has rendered it impossible to properly or accurately include this discourse within the frame of this study.

CHAPTER 4
RESULTS – THE MANAGERIAL DISCOURSE

4.1 The managerial discourse

The Great Barrier Reef (GBR), as an ecosystem and destination, is one that is discussed and represented via three main discourses: the scientific discourse, the tourism/promotional discourse, and the managerial discourse. The ways in which these discourses employ textual and visual components contribute to the painting and the creation of specific representations of the ecosystem in question. These three representations, whether some of their components overlap or not, each play an important role in the GBR's discursive ecosystem, which in turn creates an overall image and representation of the GBR. Understanding the ways in which the managerial discourse utilizes both textual and visual components to create a specific representation of the GBR will ultimately aid in understanding how the latter participates in the painting of the overall image of the ecosystem. Further, the managerial discourse, through its visual and textual elements, contributes to a better understanding of the discursive ecosystem in which the GBR is comprised.

4.2 The Great Barrier Reef as a biogeographic construct

Despite being defined as one of the better-known World Heritage Areas due to its unmatched biological diversity where ‘‘the biodiversity and interconnectedness between species and habitats represent one of the richest and most complex natural ecosystems on earth’’ (GBRMPA, 2023), the Great Barrier Reef Marine Park Authority (GBRMPA) first and foremost defines the GBR as a bio-geographic area and entity. In terms of geography, the GBRMPA has designated four different regions of the GBR, which is situated on Australia’s Northeast coast and spans from Bramble Cay to Lady Elliot Island. These include the Great Barrier Reef Marine Park, the Great Barrier Reef Region, the Great Barrier Reef World Heritage Area, and the Great Barrier Reef Catchment (GBRMPA, 2019: 4).

To begin, the Great Barrier Reef Marine Park was declared in sections between 1979 and 2001 and was amalgamated into one section in 2004 (GBRMPA, 2019: 5). This area is comprised of 344,400 square kilometers and includes approximately 70 Commonwealth islands and all waters seaward of low watermark (GBRMPA, 2019: 5). However, this area does not include Queensland internal waters, 12 trading ports and approximately 980 Queensland Islands (GBRMPA, 2019: 5). Next, the Great Barrier Reef Region, established in 1975, is made up of 346,000 square kilometers and includes approximately 70 Commonwealth islands, all waters seaward of low water mark, 12 trading ports and maritime port infrastructure (GBRMPA, 2019: 5). This area, however, does not include Queensland internal waters nor approximately 980 Queensland Islands (GBRMPA, 2019: 5). Furthermore, the Great Barrier Reef World Heritage Area, which was inscribed in 1981, is comprised of 348,000 square kilometers and includes approximately 1050 islands within outer boundary, 70 Commonwealth islands, and approximately 980 Queensland Islands (GBRMPA,

2019: 5). In addition, this area includes all waters seaward of low water mark including Queensland internal waters, 12 trading ports, and marine port infrastructure (GBRMPA, 2019: 5). Finally, the Great Barrier Reef Catchment is of 424,000 square kilometers, includes 35 river basins that flow into the Great Barrier Reef Region, six natural resource management regions and land-based port infrastructure (GBRMPA, 2019: 5). The Catchment, however, does not include land seaward of low water mark nor maritime port infrastructure (GBRMPA, 2019: 5). Within the GBRMPA's discourse, and for the purpose of this research, the ecosystem components within the region are referred to as the GBR ecosystem, the Reef, or simply the GBR (GBRMPA, 2019: 6). Similarly, when referring to the GBR Region, the GBRMPA includes,

> where it is relevant to the health of, or factors influencing, the Great Barrier Reef ecosystem and its heritage values, the report [and this research] looks beyond the Region's boundaries and includes the information about adjacent islands, neighbouring marine areas and the Great Barrier Reef river catchments (the Catchment) (GBRMPA, 2019: 3)

despite jurisdictional differences associated with each of the four GBR regions.

Overall, the GBRMPA defines the GBR as ''the world's largest coral reef ecosystem, stretching 2300 kilometres and comprising almost 3000 individual reefs'' (Spalding *et al.,* 2001 in GBRMPA, 2019: 24) but also as one vast ecosystem comprised of various habitats. The Reef ecosystem includes approximately 1050 islands, 2300 kilometres of mainland beaches and coastlines, 2710

square kilometers of mangrove forests, seagrass meadows as low as 61 meters below the water's surface, a lagoon floor that accounts for 61% of the region, more than 1580 shoals covering 25,600 square kilometres (GBRMPA, 2019: 21-26), *Halimeda* banks greater than 20 meters thick, a continental slope of approximately 51,900 square kilometres and a water column of 7200 cubic kilometres (Johnson and Marshall, 2007 in GBRMPA, 2019: 28). Together, these habitats host 41 mangrove species, 15 seagrass species, 880 species of benthic algae, at least 2500 species of sponges, at least 1000 soft coral and sea pen species, 450 species of hard corals, 630 species of echinoderms, at least 1300 crustacean species, at least 6000 species of molluscs and at least 1000 species of worms. In addition, these habitats are home to 332 species of bryozoans, at least 100 jellyfish species, at least 150 species of anemones, at least 300 species of tunicates and 1625 species of bony fishes. The GBR's vast ecosystem further supports 136 species of sharks and rays, 14 species of sea snakes, 6 marine turtle species, 20 nesting seabird species, 41 species of shorebirds, more than 30 species of whales and dolphins, and one species of dugongs and crocodiles (GBRMPA, 2019: 29). As such, without including plankton and microbes, which exceed more than one billion living microorganisms per litre of seawater (GBRMPA, 2019: 33), the GBR ecosystem hosts more than 16,572 different species, thus making it the most diverse ecosystem on Earth (GBRMPA, 2019). Given its incredible vastness in addition to its biological and ecological diversity, the GBR must be managed through the utilization of strict and specific scientific approaches (GBRMPA, 2019).

4.3 Managing the Reef, managing science

The GBRMPA works with Traditional owners, other Australian and Queensland government agencies, community organizations, and individuals as Australia's lead management agency for the GBR with the ultimate mission of protecting and preserving the ecosystem (GBRMPA, 2023). Since 1975, the GBRMPA has utilized the Great Barrier Reef Marine Park Act (1975) to guide its management and provide the best available scientific knowledge to protect the GBR's values, reduce threats, and improve both its current and long-term outlook (GBRMPA, 2023). The GBRMPA has a long history of working collaboratively with science and knowledge providers to base its management practices on ''the best available science'' (GBRMPA, 2023). The GBRMPA further recognizes the importance of scientific collaboration and states,

> [e]very few years we reflect on our knowledge gaps, particularly following our five year Outlook Reports, and identify priority needs. Scientific information is a critical part of evidence-based decision making and reporting. An increasing knowledge base about the Great Barrier Reef is supported by a wide range of science and knowledge providers including research institutions, government agencies, universities, Traditional Owners, industry and the Reef community. We value these partnerships and will continue to support cutting edge science and monitoring on the Great Barrier Reef that align with our priority needs (GBRMPA, 2023).

Specifically, the GBRMPA uses science and knowledge to support: identifying emerging risks to the Reef, setting and monitoring triggers for management intervention, developing policies, planning & developing management strategies, providing expert advice to government & stakeholders, sound decision making, adaptive management & incident response, developing

community partnerships based on shared understanding, and preparing Outlook Reports (GBRMPA, 2023). In fact, the GBRMPA (2019: 11), in referring to the Authority's main and most exhaustive means of communication, affirms that ''[t]he Outlook Report is based on the best available evidence'' and further,

> [p]ublished peer-reviewed literature from technical experts is prioritised over other forms of evidence. Long-term data sets and peer-reviewed monitoring program reports are also considered highly persuasive evidence. Statistics from government-managed entities (…) are integral to the analyses in several chapters. Consultant reports may also be considered as part of the available evidence, but do not hold as much weight (particularly if not peer-reviewed) (GBRMPA, 2019: 11).

Ultimately, this statement provides an insight of the importance of utilizing the scientific discourse as the backbone to the managerial discourse. Through the sustained investment in science and long-term partnerships with research providers in addition to the ongoing involvement of tourism, the commercial fishing and ports industry, Traditional Owners, and community contribution through citizen science programs (e.g., the Eye on the Reef monitoring program), the Authority is focused on facilitating the exchange of scientific knowledge between science providers and government, Traditional Owners, industry (including tourism), and the community (GBRMPA, 2023). Importantly, the Authority utilizes co-design, co-production and sharing of knowledge as the preferred approach to harnessing science and knowledge for evidence-based policy and decision making (GBRMPA, 2023). As such, it is evident that knowledge provided through science fuels and sustains a large portion of the managerial discourse.

4.4 An ecosystem of multiple values

Scientific knowledge fuels much of the GBRMPA's discourse on the Reef's various values including those associated with biodiversity, ecosystem health, and natural heritage. Properties, such as the GBR, inscribed on the World Heritage List all have outstanding universal value (GBRMPA, 2019: 87). The latter is defined as ''cultural and/or natural significance which is so exceptional as to transcend national boundaries and to be of common importance for present and future generations of all humanity'' (Intergovernmental Committee for the Protection of the World Culture and Natural Heritage, 2017 in GBRMPA, 2019: 87). The GBRMPA's discourse on the assessment of the Reef's natural heritage values focuses on five components which include natural beauty and natural phenomena, major stages of the Earth's evolutionary history, ecological and biological processes, habitats for conservation of biodiversity, and integrity. Importantly, biodiversity and ecosystem health do not make up values in and of themselves. However, the latter are discussed as they form the regulatory requirements for assessing natural heritage values (GBRMPA, 2019: 85).

The GBRMPA affirms that the GBR was inscribed as a world heritage property due to its exceptional natural beauty through the visibility of its aerial panorama of seascapes from space, and spectacular scenery above and below the water (Department of Sustainability, Environment, Water, Population and Communities, 2012 in GBRMPA, 2019: 88). While the most significant

elements that make up the GBR's exceptional natural value include annual coral spawning, whale migrations, nesting turtles and spawning aggregations of various fish species (Department of Sustainability, Environment, Water, Population and Communities, 2012 in in GBRMPA, 2019: 88), the GBRMPA, through scientific studies and extensive monitoring, confirms that ''[t]hese species and processes endure, but they are under increasing pressure from cumulative impacts'' (GBRMPA, 2019: 88). As the GBR's natural values are closely aligned with its aesthetic attributes, the ecosystem's aesthetic values rely heavily on the condition of the Reef's ecosystem regulatory processes such as biodiversity and ecosystem health (GBRMPA, 2019: 88). Biodiversity was assessed in terms of habitats and populations of species, as a critical component of the Reef's outstanding natural heritage value. In addressing the results of this assessment, the GBRMPA states

> [a]cross the entire Region, the condition of habitats (as a group) was rated poor, compared with a rating of good in 2014. This deterioration reflects that habitat loss and degradation or alteration in a number of areas have had persistent and substantial effects on populations of some dependent species. The significant and large-scale impacts on coral reef habitats and coral species from extreme sea surface temperatures due to global warming has resulted in these components transitioning from poor to very poor condition for the first time in the history of Outlook reporting. Exposure to high sea surface temperatures and severe cyclones are also likely to have influenced the condition of other habitats (GBRMPA, 2019: 88).

Similarly, ecosystem health is used in assessing the Reef's aesthetic and thus natural heritage values. Ecosystem health encompasses species interacting within the physical and chemical environment to keep an ecosystem functioning (GBRMPA, 2019: 49). An ecosystem is considered healthy if it can maintain its structure and function despite external pressures (Costanza and

Mageau, 1999 in GBRMPA, 2019: 49). In assessing ecosystem health as a means to assess the Reef's natural values, the GBRMPA communicates,

> [e]xposure to both acute and chronic disturbances, such as record high sea temperatures and poor water quality, have contributed to an overall decline in ecosystem condition, with both ecological and physical processes assessed as deteriorating. (…) Extreme thermal stress in 2016 and 2017 underscored the deterioration of sea temperature to very poor. The deteriorating condition of many ecological processes has affected the integrity of the Region's outstanding universal value (GBRMPA, 2019: 49).

Thus, through scientific reporting and knowledge, the GBRMPA's discourse expresses that overall, habitats in the GBR Region are assessed to be in poor condition, which in turn affects aspects of the ecosystem's natural beauty and phenomena. Specifically, the GBRMPA's discourse affirms that widespread coral death caused by elevated sea temperatures, crown-of-thorn starfish predation, and impacts from severe cyclones (all climate change related impacts), have and continue to affect the aesthetics and natural beauty of some parts of the GBR region both above and below the water (GBRMPA, 2019: 88).

Next, containing components associated with major stages of the Earth's evolutionary history has attributed the GBR with outstanding natural value. In fact, ''[i]n the context of Earth's evolutionary history, long-term active calcification and accretion, which are important ecological and biological processes, add to its outstanding universal value'' (Brook *et al.,* 2017 in GBRMPA, 2019: 89). In assessing this criterion of universal natural value, the GBRMPA, in utilizing scientific evidence,

states ‘‘[w]hile the Reef continues to provide outstanding examples of the Earth’s evolutionary history and geomorphological diversity, (…) unprecedented recent disturbances (…) will have long-lasting effects’’. While processes that affect reef formation, such as ocean acidification, sea temperature rises, and sea level rises are intensifying negatively due to climate change (Hopley and Smithers, 2019 in GBRMPA, 2019: 89), the Reef’s geomorphology is threatened (Pandolfi and Kelley, 2019 in GBRMPA, 2019: 898). As such, the GBRMPA’s (2019: 89) discourse states that ‘‘[t]he ecological process of reef building has deteriorated since 2014 and is considered poor (…). Due to these widespread threats to geomorphology, the Reef’s resilience is decreasing and its size is becoming a less effective buffer for this world heritage criterion’’.

In a similar fashion, ecological and biological processes contribute to the Reef’s outstanding universal value (GBRMPA, 2019: 89). The assessment of the Reef’s ecological and biological processes is based on the latter being intact across the entire GBR Region and through the ecosystem’s ability to maintain its structure and function while facing external pressures (GBRMPA, 2019: 89) such as those associated with climate change. In addressing the assessment of these criterion, the GBRMPA’s discourse states

> [a]t a Region-wide scale, ecosystem processes have not ceased to operate. However, ecological and biological processes that are fundamental to a functioning ecosystem (…) are considered to be in poor condition. (…) Reefs, islands, cays and the mainland remain connected by functioning ocean current systems and weather patterns. However, since 2014, the condition of one of the most critical physical processes, sea temperature, has deteriorated to very poor condition across a wide area as a result of climate change. This has led to substantial changes in some processes. The global significance of the

> Reef continues to be underpinned by the form and structure of its organisms, as well as the interconnectedness of the Reef's complex physical, chemical and ecological processes. Overall, the condition of processes across the Region is variable, with deterioration in some areas (GBRMPA, 2019: 89).

Moreover, the combination of its biodiversity, network of a plethora of habitats and species, makes up an important aspect of the GBR's outstanding universal value. However, the managerial discourse through the GBRMPA utilizes science to confirm

> for the first time since Outlook Report assessments began in 2009, habitat loss and degradation has occurred in a number of areas, its condition overall is poor and biodiversity is being affected. (…) The habitat and species condition grades reflect the increasing cumulative pressures the Region faces from changing climate and other anthropogenic impacts. Multiple disturbances have transformed coral reef structures on a broad scale across the entire Region and cumulatively hindered the recovery of some coral-dependent species. (…) Habitats for conservation of biodiversity are deteriorating, with observed loss and alteration of many elements necessary to maintain outstanding universal value (GBRMPA, 2019: 90).

Lastly, in addressing the GBR ecosystem's integrity, the Authority's discourse, supported by scientific evidence, states,

> [t]he spatial extent of the World Heritage Area has remained generally unchanged since the time of inscription. The property's size, at least for some of its habitats, is becoming a less effective buffer against ongoing multiple Reef-wide disturbances. (…) The widespread loss of coral habitat, warming seas and intensifying external pressures from outside the Region are affecting the property's intactness. (…) While the property

> remains whole and intact, the condition of many elements that make up the four world heritage criteria are deteriorating (GBRMPA, 2019: 90).

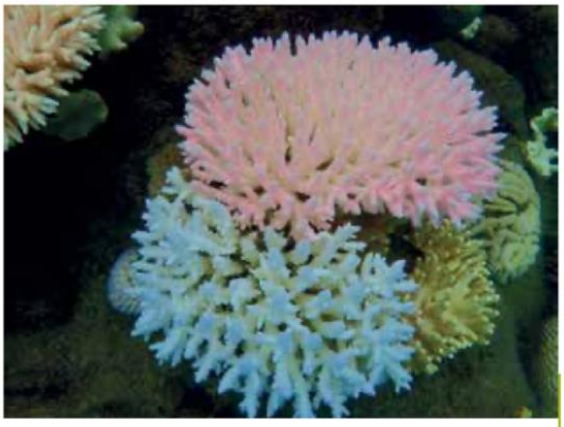
As such, by utilizing scientific evidence to fuel the discursive and textual components of the managerial discourse, the GBRMPA paints one overall image of the GBR, specifically in reference to the ways in which climate change has and continues to alter its integrity and resilience. In employing scientific evidence, the managerial discourse paints the GBR as an ecosystem that is undergoing extensive disturbance and destruction. Further, the managerial discourse, through its textual elements, creates an image of a Reef that is losing resilience. Importantly, the GBRMPA's discourse textually defines, with specific reference to the GBR, resilience as

> [t]he capacity of a system to absorb disturbance and reorganise so as to retain essentially the same structure, function, identity and feedback systems (Walker *et al.,* 2004 in GBRMPA, 2019: 225). Resilience cannot be measured directly – assessing the resilience of a system depends on how well it responds to, withstands, adapts and recovers from disturbances (Folke *et al.,* 2010 in GBRMPA, 2019: 225). Climate change is by far the strongest driver of change in the Region (Poloczanska *et al.,* 2013 in GBRMPA, 2019: 225). Recurrent temperature extremes are increasing in both severity and frequency, threatening to overwhelm the Region's resilience by reducing its ability to withstand and recover from these adverse events (Hughes *et al.,* 2018 in GBRMPA, 2019: 225).

However, the visual components which accompany these scientific-backed textual elements contribute to a managerial discourse that is highly dichotomous. This dichotomy further depicts the fact that the GBRMPA internalizes a double discourse. Indeed, while some images depict a Reef that is subject to ongoing disturbances through climate change, these are few and far in

between. For the most part, these images still incorporate aesthetic elements such as vivid colour, life, and movement thus making it difficult to perceive deterioration, destruction, and overall ecosystem decline. As an example, while the following images (Figure 4.1 and Figure 4.2) are meant to depict mass coral bleaching events on the Reef which often result in mass coral die-offs, the images still include various colours, diversity, and live coral. Importantly, the images depicted are those of coral which are bleached, but still alive as opposed to completely dead coral.

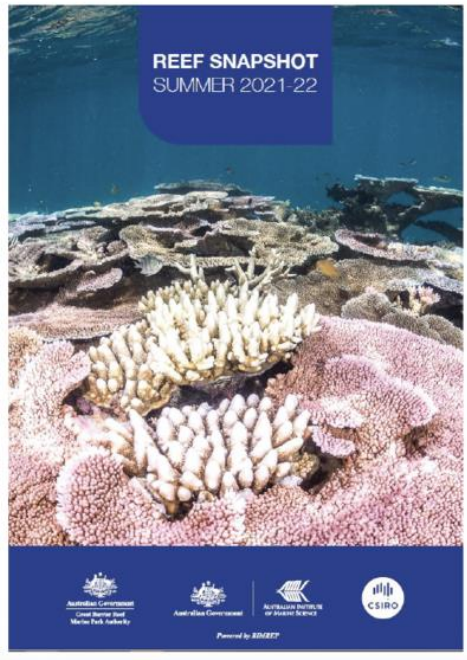
Bleaching susceptibility varies among coral species, with branching and tabular varieties (bleached in the photo) more vulnerable to thermal stress and bleaching-related mortality than massive coral (unbleached underneath).
© GBRMPA 2016, photographer: Jessica Stella



Bleached hard and soft corals at Low Isles, March 2017.
© Jenni Fox 2017

Reefscape during the 2016 mass coral bleaching event. Some bleached corals appear white, while others appear fluorescent.
© GBRMPA

Figure 4.1 Images of bleached coral (GBRMPA, 2019)



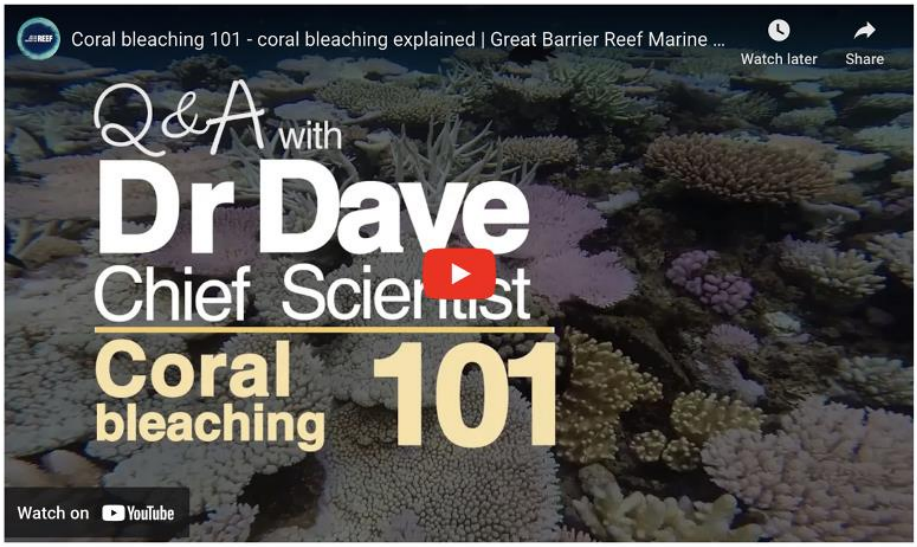


Figure 4.2 Images depicting coral bleaching on the GBR (GBRMPA, 2023)

Very few images provided in the managerial discourse, both in the 2019 GBR Outlook Report and GBRMPA website, depict a Reef under rapid deterioration and threatened ecological integrity to the untrained eye (Figure 4.3). Instead, the managerial discourse shows a preference for utilizing diagrams and drawn images when referring to deterioration and disturbance (Figure 4.4) or videos where deterioration, lack of resilience, and presence of death is only depicted for a very brief amount of time all while comparing the latter with healthy coral (Figure 4.5). While very few images depicting a rapidly deteriorating and disrupted Reef are provided, the GBRMPA instead utilizes visual elements of a vibrant, colourful, lively, and diverse Reef (Figure 4.6).

Algae overgrowing a branching coral. © GBRMPA 2016, photographer: Jessica Stella

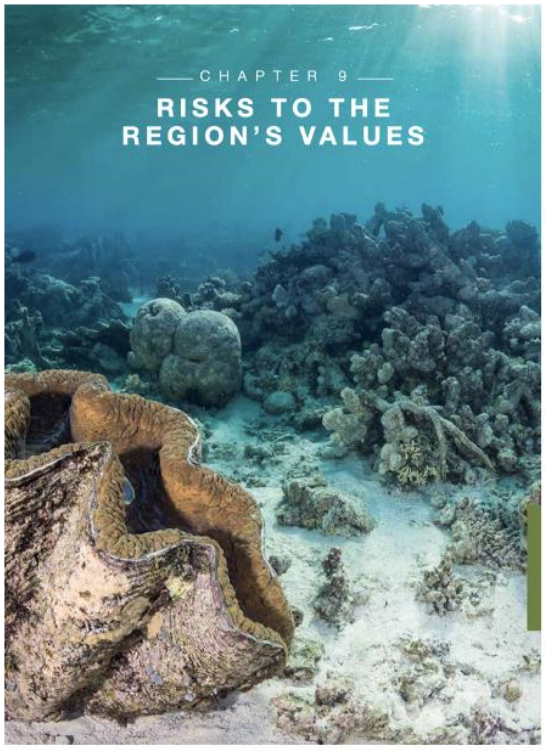


Figure 2.7 Changes to coral communities from disturbances since 2014
Time series photographs depicting changes to coral reef habitats due to mass coral bleaching and cyclone Debbie. First row: Opal Reef in the northern Great Barrier Reef before, during and after the 2016 mass bleaching event. (left to right: September 2015, April 2016, November 2016). High mortality of all coral types was observed, with turf algae growing over dead coral skeletons. © Taylor Simpkins
Second row: Double Cone Island in the Whitsundays area of the Great Barrier Reef in 2014, post-cyclone Debbie in 2017 and mid-2018 (left to right). This inshore reef monitoring site exhibited a 97 per cent reduction in coral cover and removal of coral structure by destructive waves. © Australian Institute of Marine Science 2019

Figure 4.3 Images used by the managerial discourse which undoubtedly depict a deteriorating Reef ecosystem (GBRMPA, 2019)

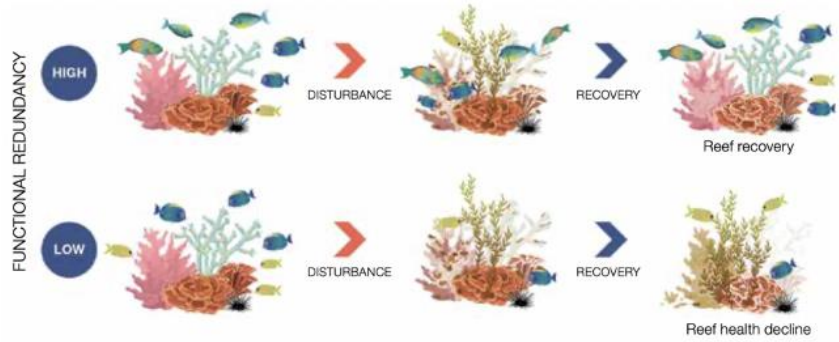


Figure 3.8 Herbivore functional redundancy
Reefs with high functional redundancy (top) have a higher number of animals that perform important functions, such as algal removal, which helps reefs recover faster following disturbance. Reefs with low functional redundancy (bottom) have less capacity to respond to, and recovery from, disturbances. Source: Adapted from Nash *et al.* 2016[601]

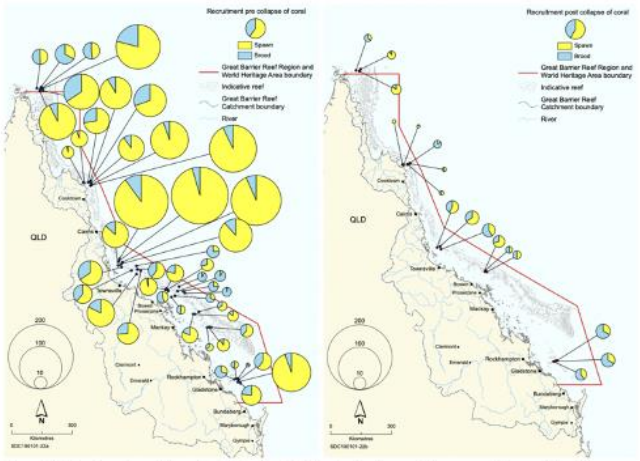


Figure 3.11 Coral recruitment along the 2300 km length of the Reef before and after consecutive mass bleaching events in 2016 and 2017
Left: Average density of recruits (mean number of settled coral larvae per sampling panel on each reef), measured over three decades, from 1996 to 2016 (sample size of 47 reefs, 1784 panels).
Right: Density of recruits after mass mortality of corals in 2016 and 2017 due to back-to-back bleaching events (sample size of 17 reefs, 977 panels). Yellow and blue indicate the proportion of spawning and brooding coral species, respectively. The size of each circle represents the overall recruit density for spawners and brooders combined. Source: Hughes *et al.* 2019[90]

Figure 4.5 Management discourse's use of diagrams and drawn images to show deterioration and disturbance of the Reef's ecosystem integrity (GBRMPA, 2019)

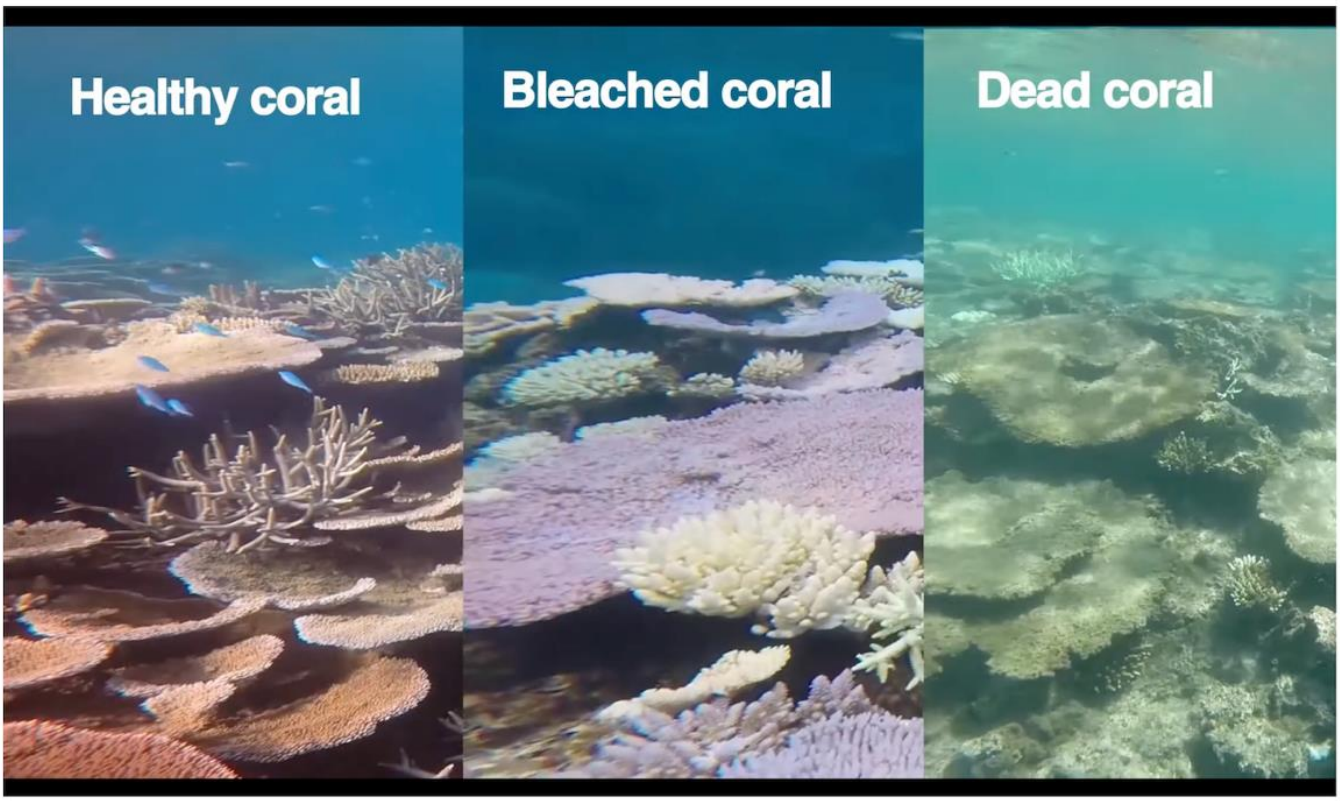


Figure 4.4 Screenshot of Coral Bleaching 101 video on the GBRMPA website depicting a comparison of healthy, bleached, and dead coral (GBRMPA, 2023)

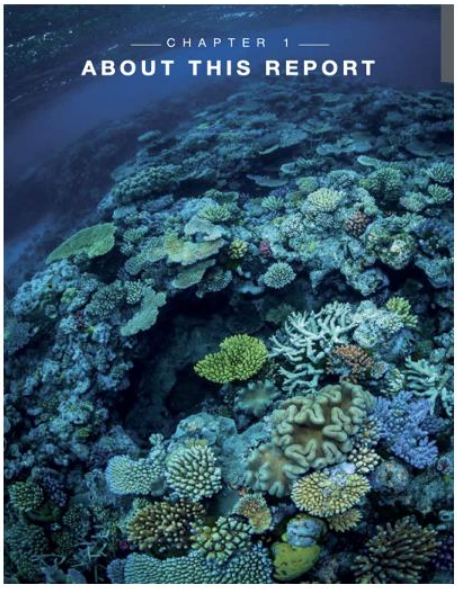
Lagoon floor habitats support an array of species. © Matt Curnock

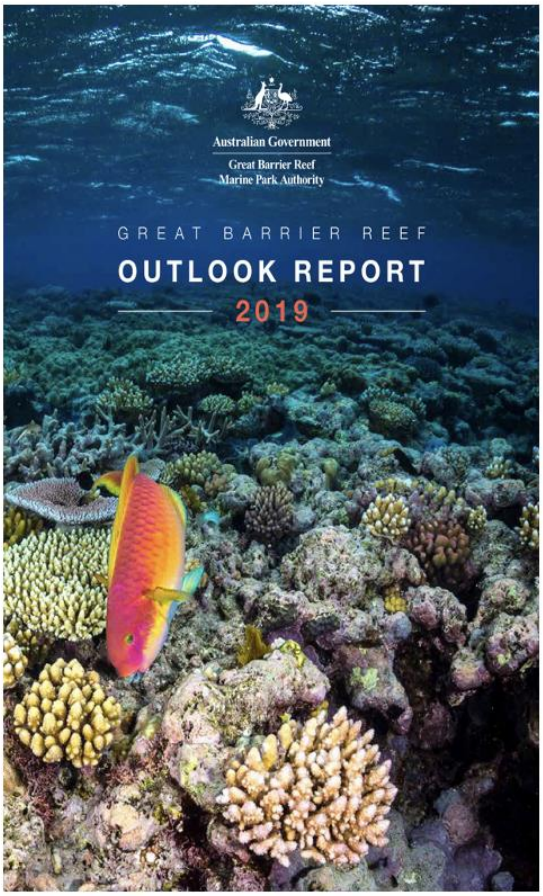
Figure 3.9 Clownfish in a bleached anemone
The clownfish (Amphiprion percula) nestled within a bleached host anemone during the 2016 marine heatwave on the Great Barrier Reef.
© GBRMPA 2016, photographer: Jessica Stella

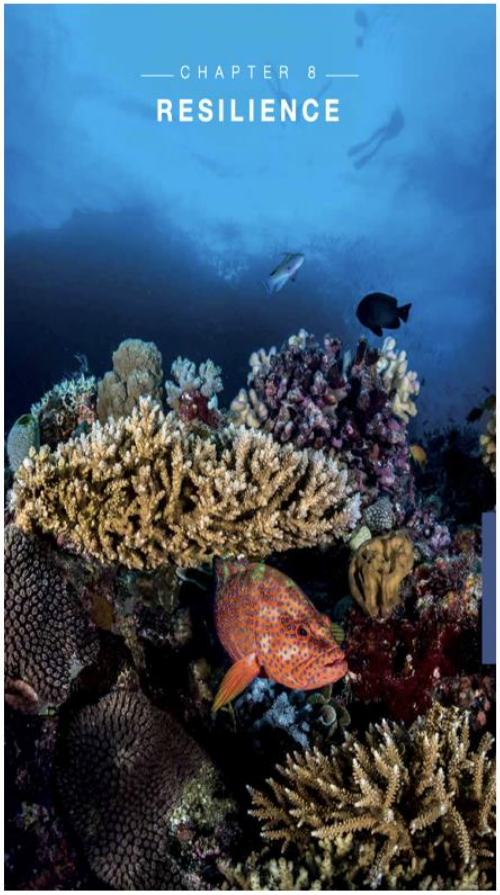
Light penetrating the surface waters above a shallow reef. © Matt Curnock

Reef sharks patrolling the reef crest. © Matt Curnock

The Reef is still strongly associated with beauty, but is also perceived as being significantly under threat. © Matt Curnock 2017







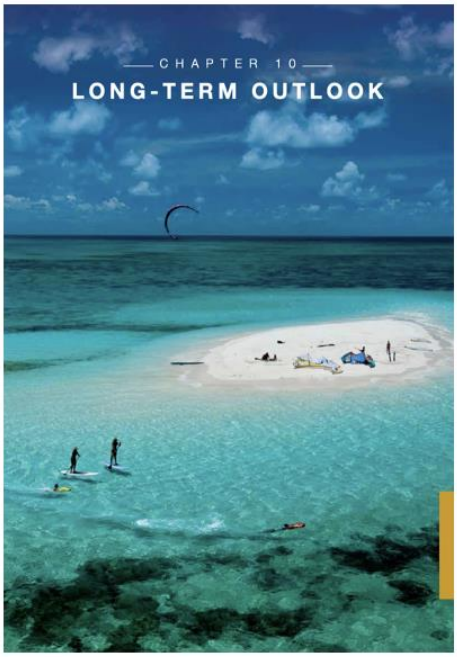


Figure 4.6 Examples of most images used by the managerial discourse, which depict a resilient, vibrant, colourful, lively, and diverse Reef (GBRMPA, 2019)

The dichotomy within the managerial discourse can be made especially apparent in comparing its textual and visual elements which communicate two entirely opposing representations of the Reef within one given context. While the chapter dedicated to GBR resilience provides a plethora of textual components, through utilizing scientific evidence, that the Reef's resilience is declining on a whole-of-Region scale, the chapter's main image (Figure 6) is one that paints the Reef as healthy ecosystem where diversity, movement, life, colour, and vibrancy are apparent. This theme is further repeated in the image provided as the 2019 Outlook Report's first and main image (Figure 6) and as the Report's first chapter, entitled *About this Report*. Utilizing these types of images as the Outlook Report's main photo and whole-of-report chapter image seems to communicate the idea that the entire report paints a picture of a vibrant, diverse, resistant, lively, and healthy Reef. It is only by using textual elements provided through scientific evidence that it is made clear that this is not the case, thus further contributing to the managerial discourse's duality. Moreover, while the managerial discourse provides an overall summary of heritage values at the end of the *Heritage Values* chapter which states,

> [t]he Great Barrier Reef remains whole and intact and maintains many of the elements that make up its outstanding universal value, as recognised in its world heritage listing. However, significant components that underpin all four natural world heritage criteria for which the World Heritage Area was inscribed in 1981 have deteriorated since its inscription. (…) Given that the impacts from climate change are accelerating, the overall assessment of the Reef's world heritage and national heritage value is good, borderline poor (GBRMPA, 2019: 106),

the image accompanying this textual component depicts an entirely different image of the Reef (Figure 6) where even the textual components accompanying this image, which states ‘‘[t]he Reef is still strongly associated with beauty but is also perceived as being significantly under threat’’ provide a dichotomy with the textual elements sourced through scientific knowledge. Indeed, both the image, which shows an aerial, vibrant, and seemingly undisturbed view of the Reef, and the image's textual components communicate that the Reef is only *perceived* as being under threat. Meanwhile, the scientific knowledge provided through text states that the Reef's values, especially natural values which are related to ecosystem integrity, functioning, resilience, and thus overall health, have deteriorated to borderline poor. As such, it is evident that there is a striking difference between what is communicated through the textual elements and scientific evidence in comparison to what is communicated through the visual elements within the GBRMPA's managerial discourse.

While the GBRMPA utilizes extensive scientific information and knowledge to fuel their discourse on the natural heritage values of the GBR ecosystem, this is done to a lesser extent when economic value, particularly in respect to tourism, is addressed. In assessing the Reef's commercial use, the GBRMPA (2019: 110) utilizes the criteria of economic and social benefits of use and impacts of use in the Region's values. In terms of tourism's association with climate change, the managerial discourse simply acknowledges, in reference to the scientific literature, that tourism is responsible for five percent of global fossil fuel consumption and emissions and states,

> [g]iven the large distance of mid and outer-shelf reefs from the Queensland mainland, fuel consumption in the Reef tourism industry is likely to be far greater than at other locations where reefs are in closer proximity (…). The Reef (like Australia) is also typically a long-haul destination for visitors from most countries, so carbon emissions associated with international visitation are higher than those for other tourist destinations. An integral part of the assessment for the Hight Standard Tourism Operator program is providing evidence that the tourism operation is dedicated to reducing carbon emissions and committed to sustainable practices that address climate change (GBRMPA, 2019: 110).

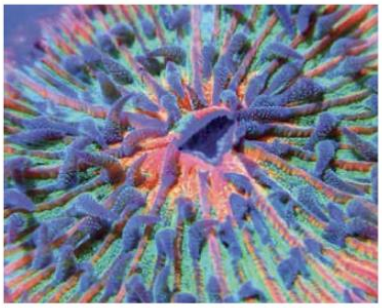
The GBRMPA (2019: 112-114) further acknowledges that the Reef's health (overall integrity and resilience) is extremely important to the stability and value of the Reef tourism industry but that marine tourism activities can pose threats to both the ecosystem and heritage values through incompatible uses, vessel groundings, emissions, and in certain locations, marine debris, and sewage discharge. In divulging these threats, the GBRMPA states

> [f]or more than 40 years, implementation of government management plans and policies have had to balance the protection of the Region against the needs of communities and industries that depend on the Reef for traditional use, social and cultural purposes, and livelihoods. (…) Management has been, and continues to be, based on the best available scientific information and intergenerational knowledge. (…) Commercial and non-commercial uses collectively form an important part of the social and economic fabric that supports the adjacent communities in the Catchment and the broader Australian and international communities. The economic and social benefits of each commercial and non-commercial use is considered in terms of its benefit to the community and the natural ecosystem more broadly. All commercial and non-commercial uses, Reef-dependent or not, have the potential to conflict with the long-term protection, conservation and function of the Reef's natural heritage values. Therefore, management of these uses is factored into the assessment of the potential impacts of these uses (GBRMPA, 2019: 110).

However, despite this, the Authority's discourse is one that seems to favour and promote tourism due to its increased contribution to the Reef's economic value. In fact, the sentence following the above quotation within the Outlook Report is ''[t]ourism, fishing, other recreational uses and scientific activities contribute significant benefits to the Australian economy'' (GBRMPA, 2019: 110). Communications through their website reinforce the Authority's concern regarding climate change impacting the Reef's economic value through statements such as ''[c]limate change poses one of the greatest risks to the future economic value of Reef-dependent industries such as tourism'' (GBRMPA, 2023) and in communicating that the Authority is concerned about how climate change will affect tourism business through ''the impact of reef site degradation, poor recovery of bleached sites as a result of other stresses, and a loss of marketing appeal as a high-quality reef destination'' (GBRMPA, 2023).

As such, while it is evident that the managerial discourse briefly communicates, through its textual components backed by scientific evidence and knowledge, the idea that tourism contributes to the overall decline in the Reef's ecosystem integrity and resilience, the discourse is one that seems to promote tourism through its focus on tourism's economic value and benefit. This idea can be further supported through the images and visual components provided within the Authority's discourse regarding tourism and the Reef's commercial use. Indeed, the images provided depict an overall vibrant, colourful, and lively reef (Figure 7). Interestingly, however, most images provided in relation to the Reef's commercial use and tourism focus heavily on landscape and scenery as opposed to focusing on coral, wildlife, and underwater aesthetic components (Figure 8). Nonetheless, a minor dichotomy is present in the GBRMPA's managerial discourse with specific

relation to tourism, where textual components of the discourse provide scientific evidence as to the ways in which tourism negatively affect the Reef's integrity and resilience through climate change whereas images do not reflect the latter. Moreover, there exists a further internalized double discourse where the discourse's textual elements regarding tourism and commercial use depict a seemingly integral Reef and where the discourse's textual components, regarding the Reef's ecological integrity and resilience, show an evident downward trend thus painting the Reef as one that is undergoing rapid and potentially irreversible decline.



The coral fishery supplies marine aquarium enthusiasts with attractive specimens like this Fungia species. © Cairns Marine

Underwater reefscape view of diver on Patches 3 Reef.
© Matt Curnock 2018

Figure 4.7 The managerial discourse's visual components regarding tourism on the GBR (GBRMPA, 2019)

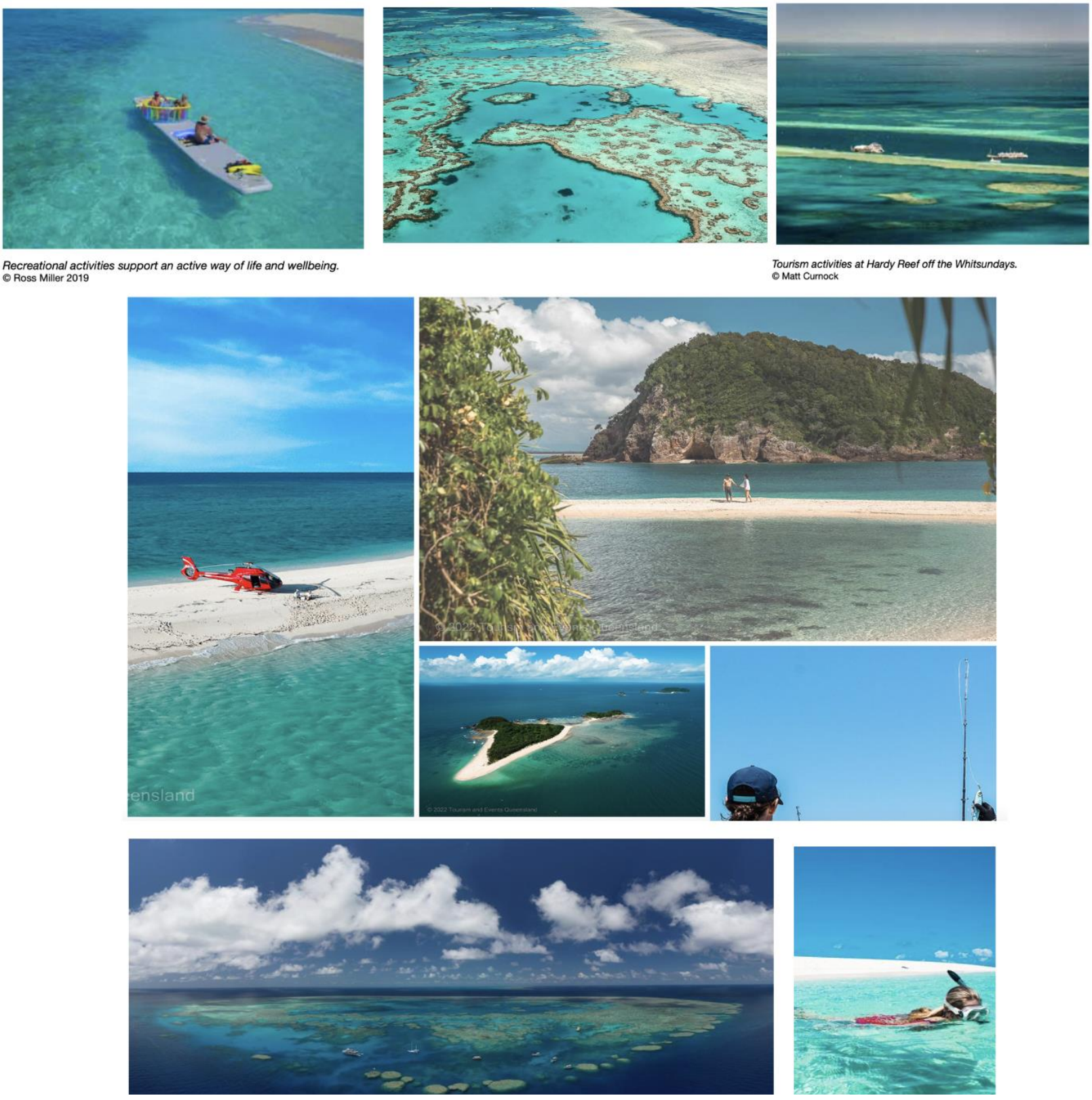


Figure 4.8 The discourse's components focused on tourism through landscape and scenery (GBRMPA, 2019)

4.5 Tourism as a hopeful road to protection

By placing increased importance on tourism's contribution to the Reef's economic value, the managerial discourse further states that commercial marine tourism delivers benefits to tourists, tourism operators and the environment

> because strong cultural connections with the environment can empower stewardship and engagement in environmental protection. Some tourism operators have increased stewardship at their local sites through adhering to responsible reef practices, practising small-scale permitted coral gardening, and delivering high quality interpretation about the Reef by accredited Master Reef Guides (GBRMPA, 2019: 113)

which, in turn, can provide visitors with information on what they can do to protect the Reef (GBRMPA, 2019: 113). Thus, despite the several negative direct and indirect impacts of tourism on the GBR's natural heritage values, notably through participating in the accumulated effects of climate change, but also through physical damage related to activities such as concentrated snorkelling and diving in high-use areas or through vessel groundings often caused by a considerable number of offences by tourism operators, the GBRMPA's discourse is one that not only seems to promote tourism, but also one that seems to excuse it. Indeed, the GBRMPA (2019: 113) states, without further detail or specific reference numbers provided through scientific evidence, ''[a]lthough a considerable number of offences by tourism operators are recorded each year, particularly from the Cairns and Whitsunday planning areas, the environmental impact of these is relatively low''. In discussing tourism and climate change, the GBRMPA's discourse

continues to promote tourism as opposed to putting it in question. Through communications such as

> Marine Park rules help protect the Great Barrier Reef and ensure it is used and enjoyed in an ecologically sustainable way. Most rules apply throughout the Marine Park (…) however there are some specially related to popular areas, certain activities and sensitive locations. Before you visit it is important to be familiar with the area you're going to and the Marine Park rules that apply (GBRMPA, 2013)

and

> [t]he Great Barrier Reef Marine Park is a multiple use area offering a variety of activities. We invite everyone to enjoy the region in an environmentally and reef-friendly way that maintains the area's ecological, cultural and heritage values. All users are responsible for the environment around them and their actions in it. Everyone can visit the Marine Park throughout the year and there are activities for all interests, ranging from fishing, to amazing snorkelling, diving and sailing experiences (GBRMPA, 2013),

the GBRMPA creates a discourse which suggests that the tourist can contribute to the Reef's ecological health and sustainability. However, the discourse suggests that the visitor can do so *once they are on site* as opposed to showing that long-haul destination tourism and *making their way to the Reef* is in fact participating in increasing fossil fuel emissions and contributing to the Reef's ecological and biological decline. Doing so would put tourism in question and further depict the

ways in which tourists are responsible in negatively contributing to anthropogenic climate change and thus responsible in negatively affecting the Reef's integrity, resilience, and thus overall health. Here, the GBRMPA adopts a bio-geological discourse based on specific Reef locations as opposed to treating the Reef as a whole-of-Region entity. In utilizing this approach, the discourse treats the different regions of the Reef as separate entities where it seems to be suggested that only certain areas are affected through climate change. Through the use of a bio-geological approach, the GBRMPA is able to bridge the gap between its internalized double discourse where one discourse suggests that the Reef is undergoing rapid deterioration and needs protecting from the effects of climate change, and where the other suggests that the Reef is not only a perfect area for tourism, but also one where this tourism can ultimately result in its protection from further deterioration. Doing so allows the discourse to bridge the contradiction between its textual elements, based on scientific evidence, highlighting the fact that the Reef is undergoing rapid decline and transformation because of climate change, and the textual components suggesting that tourism, through climate change, may bring about negative effects on the Reef but can be excused due to its high economic value. Ultimately, by adopting a bio-geological discursive approach, the GBRMPA's communications, through an internalized double discourse, suggests that visitation can ultimately contribute to improving the Reef's overall ecological health status in various ways.

First, the managerial discourse suggests that visitors can help preserve the Reef by choosing high standard tourism operators who ''help to protect and present the Marine Park to a consistently high standard and are recognised by the Great Barrier Reef Marine Park Authority for their commitment and dedication to showcasing and preserving the reef'' (GBRMPA, 2013). Furthermore, the

managerial discourse suggests that by participating in Citizen Science programs, such as the Eye on the Reef monitoring and assessment program, ‘‘enables anyone who visits the Great Barrier Reef to contribute to its long-term protection by collecting valuable information about reef health, marine animals and incidents that is used to understand the bigger picture and inform how we manage the Reef’’ (GBRMPA, 2013). In fact, through their online Reef Health updates, the GBRMPA continuously suggests that both tourism and tourists can take on responsibility in the protection and long-term sustainability of the Reef through narratives such as the one shared on March 3rd, 2023, stating

> Master Reef Guides work with High Standard Tourism Operators through the Marine Park, educating visitors about the Reef, its management and protection through responsible reef practices and providing us with firsthand information about what is happening on the Reef. Many Reef tourism operators partner with the Reef Authority, providing valuable information through the Eye on the Reef program, contribution to Reef Health and Impact Surveys and Tourism Weekly Monitoring. You, too, can do your bit to help by reporting what you see out on the Reef through the Eye on the Reef app (GBRMPA, 2023).

Moreover, the managerial discourse suggests that Reef tourists help conserve the ecosystem via environmental management charges where ‘‘[f]or most tourism operations, Marine Park visitors participating in a tourist activity are liable to pay the charge to the permit holder, who then remits the charge to the Reef Authority. (…) The funds received from the environmental management charge are vitally important in the day-to-day management of the Marine Park and in improving its long-term resilience’’ (GBRMPA, 2013). Thus, while the discursive elements found in the GBRMPA Outlook Reports and websites regarding the Reef’s natural heritage values are heavily

based on scientific evidence related to climate change, those regarding economic value through tourism are rather based with the premise and hopeful undertone that Reef visitation can lead to a road of ecological and biological protection and preservation. In fact, the visual elements used in the GBRMPA's managerial discourse further promote the idea that tourism may lead to ecological stability and preservation. In referring to participating in tourism through Citizen Science programs, monitoring efforts, Master Reef Guides (focused on education and sustainability) programs, the GBRMPA's visual discourse includes images where scuba divers are surrounded by large, colourful, vibrant, diverse, and seemingly healthy coral cays (Figure 9). In using these types of images, the managerial discourse seems to suggest that participating in tourism via these methods (Master Reef Guide programs, Citizen Science programs, monitoring, etc.) serves as a cure to the ongoing climatic effects to the GBR, where tourism will lead to these integral and healthy ecosystems. By using this hopeful undertone, in combination with a bio-geological approach, the GBRMPA manages to adopt a discourse that not only uses scientific evidence to communicate the ways in which the Reef's ecological integrity and resilience are declining due to the effects of climate change, but can simultaneously promote the continued commercial use of the Reef for marine tourism, therefore placing great importance on the ecosystem's economic value.

Figure 4.9 The promotion of tourism to save the Reef (GBRMPA, 2019)

4.6 The dynamic reef: climate change and changing values

In their discourse, the GBRMPA addresses several factors that impact the Reef's natural and economic values, with particular attention to those induced by global climate change. Throughout both the Outlook Reports and communications via their website, the GBRMPA, in their managerial discourse, utilizes scientific evidence to address the ways in which climate change impacts the GBR's ecosystem and overall integrity, resilience, and therefore health status. Indeed, the GBRMPA, in addressing habitats as an assessment of biodiversity and overall ecosystem health, based on scientific knowledge and evidence, states

> [t]he entire Region (habitats, species and processes) is under increasing threat from the broad-scale impacts of climate change. (…) Climate change and climate extremes have been the primary causes of habitat deterioration since 2014 (…). Unprecedented ocean warming causing mass coral bleaching in 2016 and 2017 has significantly affected large areas of the Region. Large-scale loss of coral habitat has resulted, and flow-on effects for species and ecosystem processes are still unfolding (GBRMPA, 2019: 21).

In terms of coral reef habitats, climate change has resulted in severe disturbances since 2014, which in turn has resulted in the largest loss of coral habitat ever recorded on the GBR (GBRMPA, 2019: 24). Similarly, in addressing ecological health indicators through physical, chemical, and ecological processes, the GBRMPA's managerial discourse communicates that climate change impacts have resulted in overall declines where

> [e]xposure to both acute and chronic disturbances, such as record high sea temperatures and poor water quality, have contributed to an overall decline in ecosystem condition, with both ecological and physical processes assessed as deteriorating. (…) Extreme thermal stress in 2016 and 2017 underscored the deterioration of sea temperature to very poor. The effect has influenced the deterioration of symbiosis and reef building (GBRMPA, 2019: 82).

As discussed in section 4.1.3, there exists a strong interconnectedness between ecosystem health and heritage values. As climate change has resulted in the overall decline of factors and processes affecting ecosystem health, it has, by association, also resulted in a decline of the GBR's heritage values at a Region-wide level. Thus, through using scientific evidence, the managerial discourse, in discussing elements related to the GBR's ecological health in relation to global climate change, paints an image where the Reef, at a whole-of-Region level, is one that is under severe threat and decline. The managerial discourse, however, further paints a different image of the Reef through discussing climate change related impacts at smaller geographic scales.

Given the GBR's vastness and intricate network of habitats, ecosystems, and species, the GBRMPA (2019: 21-29) expresses that conditions of habitats and species can vary highly across space and time. Indeed, as states the GBRMPA (2019: 184) ''[t]he Region is not a pristine ecosystem and it exists in a dynamic state''. As such, due to its size and ecological complexity, the GBR's condition is variable and highly dynamic across its different regions and habitats. In fact, the Authority (GBRMPA, 2019: 45) states that ''[f]or both habitats and species, grades provided are for the entire Region. The size of the Region is extensive and variability in condition exists. For example, reefs that escaped impacts of bleaching, cyclones and crown-of-thorns outbreaks

remain in good condition''. In addition, through their online Reef Health Updates (GBRMPA, 2023), the Authority provides Reef health updates according to specific areas where, for example, the communications provided on March 31st, 2023 state ''[m]inor coral bleaching was reported mostly in the central region of the Marine Park, while disease and damage were reported across all regions. Crown-of-thorns starfish outbreak severity remains highest on reefs in the central and southern regions'' and where communications provided in October, 2022 state ''[l]ow impact bleaching was recorded on some isolated reefs across the Marine Park; however the National Oceanic Atmospheric Administration (NOAA) reports the Marine Park was not under any bleaching stress in October''. Similar location-specific assessments are communicated by the managerial discourse through Outlook Reports, such as ''[u]nprecedented mass coral bleaching due to global warming, outbreaks of crown-of-thorns starfish and cyclone impacts have reduced coral diversity and abundance, with widespread loss of key habitat-forming coral species at many locations'' (GBRMPA, 2019: 43) or yet again ''[d]amage to ecosystems from cyclones is usually patchy and highly variable at local scales. (…) Since 2014, over 50 per cent of the Reef area has been exposed to destructive waves from six tropical cyclones'' (GBRMPA, 2019: 51).

Despite region-specific communications, however, the managerial discourse suggests that given that the GBR has experienced an extreme level of widespread cumulative stress since 2014, further deterioration of both habitat and species conditions is expected if threats persist (GBRMPA, 2019: 45). In a similar fashion, the GBRMPA (2019: 79), in addressing ecological processes, and more specifically the significant decline in coral cover, states that ''as time lag effects are common after mass bleaching events, impacts may still be unfolding. Ecological processes are expected to

continue to decline due to climate change impacts''. Nonetheless, in addressing climate change and the GBR's ecological status at a whole-of-Region level, the GBRMPA's discourse paints one overall image of the Reef: one that is declining in health. Conversely, in addressing climate change and the GBR's ecological status at smaller scales in addition to discussing the Reef's vastness and dynamic state, the GBRMPA's discourse paints an entirely different image of the Reef: one that is fluctuating, changing, and comprised of healthy, non-healthy, and somewhat healthy ecological components. In this latter image, however, there exists an undertone of probable future decline. As such, the managerial discourse, through utilizing the Reef's vastness and ecological complexity, paints not only one collective image of the Reef, but rather various images, thus ultimately communicating that some areas of the Reef are highly affected by global climate change, whereas others remain beautiful and intact with potential of changing through time and space. The utilization of a bio-geological approach within the managerial discourse allows for the latter to bridge the contradiction within this internalized double discourse, where the latter, on one hand, provides scientific evidence to show that the Reef's ecosystem is undergoing rapid decline and destruction, whereas on the other hand suggests that tourism can contribute to its preservation and overall health despite the fact that tourism also contributes to the climatic effects resulting in negative change to the ecosystem. In doing so and in providing vibrant, colourful, and lively images of the Reef when accompanied by discursive tourism elements, the managerial discourse communicates the idea that Reef tourism can provide the *cure* to the Reef's *health problems.*

4.7 The relationship between ecosystem health, geographic location, and tourism

The fact that the managerial discourse creates two types of representations of the GBR's ecosystem, where one is based on the entire GBR Region and the other is location-specific, is also present in discussing tourism within the GBR. Given the evidence provided in the previous section, it is obvious that climate change, due to the GBR's incredible vastness, affects some areas of the Reef differently than others. As such, the GBRMPA must provide different location-specific management strategies and permit location-specific uses, which is made apparent through their discourse. One of the most important management tools used by the GBRMPA is the *Great Barrier Reef Marine Park Zoning Plan 2003*, which helps to manage and protect the values of the GBR Marine Park (GBRMPA, 2023). Specifically, the Zoning Plan defines zones with different rules for the allowed activities, indicates which activities are prohibited and the activities that require permits according to specific locations (GBRMPA, 2023). Furthermore, specific zones may place restrictions on how activities are conducted (GBRMPA, 2023). There are eight different types of zones within the GBR Marine Park, which include General Use Zones, Habitat Protection Zones, Conservation Park Zones, and Marine National Park Zones (GBRMPA, 2023). In turn, the latter make up approximately ninety five percent of the Marine Park (GBRMPA, 2023). Other zones which include the Scientific Research Zones, Commonwealth Island Zones and Preservation Zones make up the remaining approximate five percent of the Marine Park (GBRMPA, 2023). Importantly, Preservation Zones make up less than two percent of the Marine Park (GBRMPA, 2019: 131) and simply designate that an area cannot be entered by any person unless they have written permission (GBRMPA, 2023). However, despite the GBRMPA painting a picture of a seemingly well-protected site through strict management tools such as the Zoning Plan, which aims

to protect the GBR's biodiversity, ecosystem, and heritage values (GBRMPA, 2019: 90), zoning does not necessarily impose many restrictions to tourism on the Reef.

While ''[c]ommercial marine tourism requires permission in every case [it] can be conducted in almost all zones (except Preservation Zones) of the Marine Park and several other restricted areas'' (GBRMPA, 2019: 112), the GBRMPA's discourse does not state which other restricted areas are banned from tourism activities. Given that tourism within the Region is concentrated to approximately seven percent of the area, where 86 percent of tourism visits are located within the waters near Cairns, Port Douglas, and the Whitsundays, additional strategies, on top of the Zoning Plan, help manage multiple-use and high visitation (GBRMPA, 2019: 112). In fact,

> [t]he Zoning Plan and plans of management (for the Cairns, Hinchinbrook and Whitsundays areas) help to manage multiple uses. These management tools aim to protect the environment while providing for a range of uses, particularly in high-use areas. The plans of management cap the number of tourism operations and define maximum group and vessel sizes at specific locations, and where motorised watersports can take place. These approaches were developed in part to better provide for recreational use in these areas (GBRMPA, 2019: 131).

In providing these communications, it is apparent that the GBRMPA's discourse is one that is transparent regarding management tools and ecosystem preservation needs, but that ultimately is one that is concerned with ensuring that tourism use, and by association economic value, is put at the forefront and somewhat prioritized given that tourism is welcome in almost all areas. Yes, the

Zoning Plan is aimed at preserving the ecological integrity and health of the GBR, however, the plan does not protect the GBR from direct or indirect (climate change) effects of tourism. Rather, the Zoning Plan in addition to other management tools not only fail to protect the Reef against tourism and its associated climatic impacts, but rather promote exclusivity by restricting the number of operators and tourist group sizes, thus ultimately creating competition through exclusivity, resulting in potential increased visitation and longer on-Reef travel to attain exclusive areas. The idea of exclusivity in relation to site vastness and climate change will be further discussed in a later section but is worth briefly mentioning here.

Importantly, the idea that the Zoning Plan is not ultimately concerned with protecting the Reef's ecological sustainability can be garnered through the fact that the GBRMPA states,

> this multi-tiered management regime is not designed to directly address the effects of a changing climate. Climate change remains the greatest risk to the outstanding universal value of the World Heritage Area and its integrity (GBRMPA, 2019: 90).

Instead, ''[t]hese management initiatives continue to protect coral communities under threat (…) by raising awareness and influencing the distribution of recreational activities within the Region'' (GBRMPA, 2019: 131). However, the GBRMPA, as previously mentioned, confirms that all tourism within the Region occurs in less than seven percent of the GBR. Thus, the GBRMPA creates a discourse which shows their concern for the Reef's ecological health, but also one that

does not seem to limit or restrict tourism through very many capacities. This is especially apparent as the GBRMPA has not introduced additional rules, such as expanding no-take zones to all tourism areas. In fact, ‘‘[s]ince the rezoning of the Great Barrier Reef Marine Park in 2004, a growing body of research has reported important ecosystem benefits arising from the expansion of no-take zones. As the Reef faces a range of pressures and impacts that threaten its health and future, no-take zoning and user compliance is more important than ever’’ (GBRMPA, 2019: 203). The fact that the GBRMPA adopts a discourse which seems to prioritize preservation yet does not introduce no-take zones to all tourism areas given that

> ecosystem benefits of no-take zones in the Reef include lower levels of coral disease (…) and fewer and less severe crown-of-thorns starfish outbreaks (…). Long-term monitoring data has indicated that reefs in no-take zones have a more stable community structure. Whether these findings remain following broadscale coral mortality from back-to-back bleaching events remains to be seen. However, research has shown that the magnitude of disturbance from impacts, such as a single coral bleaching event, crown-of-thorns starfish outbreaks, coral disease and cyclones, [which are all increased due to climate change], was 30 per cent lower in no-take zones, and reefs recovered 20 per cent faster than nearby reefs that are open to fishing (GBRMPA, 2019: 203),

which is a very popular tourism activity, further indicates that the GBRMPA seems more concerned with the Reef’s economic value than it does with its preservation through stricter tools and strategies which may limit and impose strict regulations to Reef tourism. Thus, the GBRMPA’s discourse paints an image of a Reef that is perfect for visitation, even though this visitation is one that continuously contributes to the very degradation of the ecosystem in question. The latter is made especially obvious in the GBRMPA’s discourse shown in their online communications on

their *Visit for leisure or recreation – Superyachts* webpage. Here, the Authority's discourse states ''[a] superyacht is a high-value luxury sailing or motor vessel used for sport or pleasure – it is a great way to enjoy the Great Barrier Reef!'' (GBRMPA, 2023). While there are no references to climate change or any type of ecosystem degradation within this section, the discourse simply states that superyachts need a permit to operate in the GBR Marine Park (GBRMPA, 2023). In addition, the photos provided on this page are twofold: those of superyachts and those of pristine, diverse, colourful, dynamic, and lively reefs. Thus, the managerial discourse, through adopting a bio-geological approach, is one that highlights the complex relationship between take zones, no take zones, management and tourism where the latter's economic value takes precedence.

By placing few restrictions on tourism, the GBRMPA can ultimately ensure that the Region attracts, and is accessible to, various types of tourist activities and visitation areas. To further the Reef's attraction as a visitation site, the GBRMPA's discourse utilizes several photos which depict the Reef as a healthy ecosystem. While certain photos show the Reef's degrading state by picturing bleached coral or changes to coral communities from disturbances since 2014 (Figure 4.1, Figure 4.2, Figure 4.3 and Figure 4.5) most photos throughout their communications are those depicting a vibrant, lively, diverse, dynamic, colourful, and healthy Reef (Figure 4.6, Figure 4.7, Figure 4.8).

It is therefore clear that the GBRMPA's discourse utilizes the Reef's vastness to seemingly increase management activities that aim to protect the ecosystem all while allowing tourism to remain largely unaffected. This type of management strategy is feasible given the Reef's vastness, as

different areas are not only affected differently by climate change, but also recover and are subject to ecosystem and biological alterations at different levels and paces. The GBR's large size allows for the managerial discourse to direct focus on certain preservation aspects such as those outlined and communicated via their Zoning Plan, but also ensure that tourism can not only continue at full force, but also create competition and exclusivity within tourism through said management tools. In turn, the managerial discourse ensures that tourism can continue to provide economic value despite the persistent and increasing existence of climate change.

Ultimately, the GBRMPA's discourse is one that utilizes the Reef's values to depict the Authority's vested interests in both the Reef's ecological & biological sustainability and in its economic value through tourism. Through utilizing scientific evidence, the GBRMPA's discourse undoubtedly communicates that the GBR is succumbing to the effects of climate change. However, through often used idyllic communications and images, the managerial discourse paints the Reef as an ''awe-inspiring region [which] has an abundance of marine life, ancient cultural connections and offers spectacular scenic views above and below the water'' (GBRMPA, 2023), which in turn does not put tourism's contribution to the ever-degrading ecosystem in question. To put forward this internalized double and contradicting discourse, the Authority utilizes approaches such as a location-specific or bio-geological one. Here, the managerial discourse can simultaneously communicate, through scientific evidence the fact that the Reef is undergoing rapid decline because of climate change and needs further protection, but also that the Reef's commercial use through tourism is not only justified, but one that may ultimately lead to the ecosystem's preservation.

CHAPTER 5
RESULTS – THE TOURISM PROMOTIONAL DISCOURSE

5.1 The Tourism Discourse

Tourism is the largest Reef-dependent industry within the entire Great Barrier Reef (GBR) Region where the GBR provides access to more than two million tourists annually, therefore contributing significantly to the Australian economy (GBRMPA, 2019: 111). In 2015-2016 alone, tourism was the most prominent direct use of the Reef, generating $2.4 billion (GBRMPA, 2019: 112). The Reef's commercial use through tourism forms an important component of both the social and economic fabric that supports communities in the Catchment, broader Australian communities, and international communities (GBRMPA, 2019: 110). Both tourists and tour operators experience several cultural, social, and/or economic benefits from commercial Reef tourism, which can be further associated with wellbeing and sense of identity (GBRMPA, 2019: 112). Despite being negatively affected by climate change, the GBR ''continues to be recognised locally, nationally and internationally as an iconic nature-based tourism experience (…) [which] contributes significantly to the economy and [its] estimated icon value'' (GBRMPA, 2019: 112). Given that the Reef's continued existence and wellbeing is such an integral component to the marine tourism industry, analyzing the ways in which the tourism discourse utilizes both textual and visual elements to create representations of the Reef in the face of climate change will provide an understanding as to how this discourse contributes to the GBR's overall discursive ecosystem. In turn, the latter will contribute to providing an understanding as to the ways in which the tourism

discourse represents an ecosystem susceptible to the ongoing effects of climate change, how the latter contributes to the ecosystem's overall representation, and how this discourse ultimately manages to further promote visitation.

5.2 Aesthetics and ecosystem health: painting a pretty picture

The GBR's aesthetic beauty is very closely aligned to the condition of the ecosystem (GBRMPA, 2019: 105) to the point where ecosystem health is used in assessing the Reef's aesthetic heritage values (GBRMPA, 2019: 49). As states the GBRMPA,

> [t]he Region's ecosystem includes all of its species interacting together within the physical and chemical environment. Ecosystem health encompasses these key interactions and processes that operate to keep an ecosystem functioning. For example, without the process of larval dispersal by currents, species and habitats would not replenish after disturbances. (…) An ecosystem is considered healthy if it is able to maintain its structure and function in the face of external pressures. (…) The systematic assessment of the health of the Reef ecosystem is based on five assessment criteria, which consider the Region's main processes: physical processes, chemical processes, ecological processes, coastal ecosystems that support the Great Barrier Reef, outbreaks of disease, introduced species and pest species (GBRMPA, 2019: 49).

In turn, physical processes are comprised of seven components which include currents, cyclones and wind, freshwater inflow, sediment exposure, sea level, sea temperature and light (GBRMPA, 2019). Furthermore, chemical processes include nutrient cycling, ocean pH and ocean salinity (GBRMPA, 2019). Ecological processes, however, include microbial processes, particle feeding, primary production, herbivory, predation, symbiosis, recruitment, reef building, competition, and connectivity (GBRMPA, 2019). Moreover, several coastal ecosystems support the GBR, which include saltmarshes, freshwater wetlands, heath and shrublands, grass and sedgelands, woodlands and forests, and rainforests (GBRMPA, 2019). Given that aesthetic beauty is closely aligned with ecosystem health, and that in turn, ecosystem health is based on these processes and criteria, it can be deduced that the Reef's aesthetic beauty, where spectacular scenery and seascapes both contribute to the aesthetic beauty of the Reef and where the aesthetic heritage values of the Reef cover land and see including seascapes, island vistas and coastal landscapes (GBRMPA, 2019: 101), is entirely based on the condition of these processes and criteria. Interestingly, the tourism discourse focuses greatly on the Reef's aesthetics even though many of these processes and conditions are declining and/or threatened. Indeed,

> [t]he majority of physical processes have remained stable or continued to decline, except currents and cyclones and wind. Further changes to these processes are expected due to the continued influence of climate change and land-based run-off, with broad implications for the Region (GBRMPA, 2019: 78).

In particular,

> [s]ince 2014, over 60 per cent of the reef area within the Region has been exposed to destructive waves from five severe tropical cyclones. Location and intensity of cyclones remain highly variable. Given other cumulative impacts, cyclones have damaged the Region's structure and impacted its function, particularly around Lizard Island and the Whitsundays. (…) [In addition,] [s]ediment loads continue to contribute to the poor state of many inshore coastal and marine ecosystems. (…) [Next], [e]xtreme thermal stress due to global warming occurred in the summers of 2016 and 2017, resulting in widespread coral mortality. Impacts on other organisms (such as fish and seabirds) are emerging. [And], [i]t is likely that underwater light availability has decreased substantially in the inshore areas of the southern two thirds of the Region due to land-based run-off, resuspension of existing sediment in the system and extreme weather (GBRMPA, 2019: 78).

In terms of chemical processes, another important set of processes which directly impacts the Reef's aesthetics, these remain in generally good condition within the Reef (GBRMPA, 2019: 79). However, land-based run-off continues to negatively affect nutrient cycling and ocean pH has decreased because of climate change (GBRMPA, 2019: 79). Ecological processes, on the other hand, have significantly deteriorated overall (GBRMPA, 2019: 79). As states the GBRMPA,

> [t]he majority of ecological processes on the Reef have deteriorated. Significant declines in the majority of coral cover throughout the Region are likely to have affected some key ecological processes, such as connectivity, symbiosis, reef building, competition and recruitment. (…) Ecological processes are expected to continue to decline due to climate change impacts and inshore land-based run off (GBRMPA, 2019: 79).

Moreover, chemical processes such as reef symbiosis, recruitment, reef building, and connectivity are particularly affected where

> [b]ased on the unprecedented decline of coral cover and the changes in coral community composition, the majority of symbioses involving coral have been significantly affected since 2016. (…) [Further,] [r]ecruitment is reduced for many key species, in particular, corals, fishes and some marine turtles and seabirds, largely due to chronic and acute disturbances. [Also,] [r]eef building has deteriorated, largely due to the combined effects of unprecedented declines in coral cover and crustose coralline algae in some areas in response to thermal bleaching events. The slow decrease in ocean pH affects reef building. [And,] [m]arine species and habitats remain connected. However, effects of climate change have altered connectivity patterns. Connectivity with some coastal ecosystems remains disrupted (GBRMPA 2019: 79-80).

In terms of outbreaks of disease, introduced species, and pest species, these remain localised and patchy across the GBR Region and introduced species continue to be recorded (GBRMPA, 2019: 81). Certain outbreaks have continued to increase and the crown-of-thorns starfish outbreak, which is amplified by the effects of climate change, continues to affect coral reef habitats significantly and negatively (GBRMPA, 2019: 81). As such, based on scientific evidence, climate change is evidently seriously and negatively affecting the ecological health of the GBR, which in turn negatively affects the aesthetic beauty of the ecosystem. Despite this, the tourism discourse uses both textual and visual components which focus heavily on the GBR's aesthetic attributes and beauty as opposed to its decline in health.

The GBR's tourism discourse utilizes a plethora of textual elements where beauty, colour and life are at the forefront. In fact, the frequency of words related to the GBR's aesthetic beauty is much more elevated than the frequency at which words related to the decline of the GBR's ecological health status are used. Words with positive connotations related to the aesthetic beauty (and

therefore ecological health) of the GBR (Table 5.1) far outweigh words with negative connotations (Table 5.2). As such, within this research's sample, the tourism discourse, in describing the GBR, therefore utilizes 12711 words with positive connotations related to only 5 categories. Conversely, words with negative connotations regarding the Reef's ecological health and aesthetics are presented at a much lower frequency. With a total amount of 4334 words used, language with negative connotation regarding the Reef's ecological health and aesthetics make up a much smaller part of the tourism discourse.

Table 5.1 Frequency of words with positive connotations amongst the 500 most frequent used words in the tourism discourse

Word used	Frequency	Category
Colourful	320	Colours
White	192	
Blues	263	
Greens	310	N= 822
Beauty	621	Beauty
Amazing	293	
Wonders	267	aesthetics
Paradise	108	
Pristine	234	
Stunning	196	N= 2476
Unique	195	
Spectacular	187	
Incredible	183	
Quality	192	
Wildlife	254	Life
Life	609	
Living	290	
Plants	98	N= 7854
Diverse	192	
Biodiversity	116	
Species	762	
Nature	741	
Coral	2870	
Turtles	732	
Sharks	182	
Whales	313	
Humpback	102	
Birds	136	
Animals	116	
Rainforest	158	
Abundance	183	
Health	254	Ecosystem
Recovery	179	
Recovers	118	health
Improve	145	
Restoration	132	
Adaptive	120	N= 1142
Resilient	194	
Immerse	114	Other
Enjoy	303	
Total	12711	

Table 5.2 Frequency of words with negative connotations amongst the 500 most frequent used words in the tourism discourse

Word used	Frequency
Changing	704
Climate	598
Impacts	578
Monitoring	327
Bleaching	321
Carbon	250
Threats	219
Warming	201
Emissions	199
Cyclonic	189
Damage	168
Decline	140
Disturbances	121
Poor	119
Issues	105
Deterioration	95
Total	4334

To better understand the ways in which the tourism discourse paints the GBR by using the words outlined within Table 5.1 and Table 5.2, context is necessary. In utilizing words and language related to wildlife, nature, and colour, the tourism discourse creates a representation of an overall healthy and aesthetically pleasing GBR. To describe the GBR, the tourism discourse utilizes language such as communicating to potential tourists that they will be immersed in and get to experience ‘‘[c]rystal clear blue waters and breathtaking emerald green islands’’ (Daydream Island), ‘‘coral reef brimming with colourful fish, some of the whitest sand beaches in Queensland and dramatic coastline’’ (Keppel Explorer), ‘‘[c]lear turquoise water, lush tropical islands and a huge array of fish!’’ (A1 Fishing Charters and Tours Whitsundays), ‘‘[t]he amazing contrast of colours’’ (Daydream Island), and further will have a chance of ‘‘exploring the colourful underwater world of magnificent corals, colourful fish and marine life’’ (Daydream Island), ‘‘experience the

beauty of this tropical climate and crystal clear waters'' (Rhemtide) and ''encounter the most incredible range of tropical fish, colourful coral and witness the wonders of the Great Barrier Reef from above and below the surface'' (Red Cat Adventures). Next, the language adopted within the tourism discourse communicates that the GBR is a pristine environment through statements such as communicating to potential tourists that by visiting the GBR, they will be immersed in ''pristine secluded beaches and uninhabited islands with stunning natural scenery brimming with marine, bird and animal life'' (Keppel Explorer) and further that the GBR's ''pristine waters are home to more fish than anywhere else on earth'' (Reel Deep Charters).

The tourism discourse utilizes language pertaining to aesthetic beauty, colour and presence of life, which in turn, due to the relationship between positive aesthetic attributes and positive ecological health, paints a very specific image of the GBR: one that is alive and healthy. Interestingly, the tourism discourse occasionally adopts this language via textual components in reference to specific areas of the GBR. In fact, statements such as

> [s]wim around bommies (coral outcrops) just by the boat, go through the swim through on the coral gardens, where you can find a cousin of Nemo residing. See an array of hard corals and soft corals, including some beautiful beds of turquoise staghorn corals. These are a favourite of ours, where you can watch the little damsel fish dart in and out as they inquisitively check out the divers, before heading back into the coral for cover. Look out for and hear (!!) the stunningly coloured Parrot Fish as they graze the algae on the coral. Swim with schools of trevally, spangled emperors and sweet lips, to mention just a few of the residents around Green Island. Keep your eyes peeled for everyone's favourite, the sea turtles that commonly frequent the site and another crowd pleaser, the black-tipped reef sharks who are very shy and timid'' (Ocean Freedom)

and

> Low Isles is a stunning Great Barrier Reef coral cay, sitting just 15kms north-east of Port Douglas. The cay itself has golden sandy beaches, rich green vegetation and an iconic lighthouse which makes this a postcard location. The warm waters which surround it are home to over 150 different species of corals, a combination of hard branching corals and array of colourful soft corals. Growing on walls and bommies, the corals provide haven for a range of marine life, large and small. Wrass and Fusiliers dart around the edges, neon blue Chromis fish dance in the staghorn corals while Anemonefish are dotted around the reef. If you listen while snorkelling, you'll hear the schools of Parrotfish grazing on the corals and keep watch to spot Green Sea Turtles (ABC Snorkel Charters)

refer to Green Island and the Low Isles as specific areas within the GBR. In referring to areas of the GBR, the tourism discourse equally refers to very broadly defined regions such as communicating to potential tourists that visiting will offer opportunities like ''[s]norkelling on the Southern Great Barrier Reef with the stunning marine life and [taking] selfies with the turtles in the pristine clear aqua blue water'' (1770 Reef) and further opportunities to

> [s]wim & snorkel and scuba dive with thousands of brightly coloured fish and the diverse corals of the outer Great Barrier Reef, and witness diverse marine life including humpback whales, dolphins, turtles and dugongs. You can even see marine wildlife like turtles and stingray while snorkelling off the beach at the fringing reefs which surround most of the 74 islands of the Whitsundays (Elysian Retreat).

These above statements refer to areas of the GBR which are both broad and undefined. In fact, the Southern GBR and the outer GBR are both large regions, which the tourism discourse does not define in terms of specific geographic boundaries. While a portion of the tourism discourse utilizes a bio-geographic approach to describe certain regions within the GBR, it also oftentimes refers to the Reef as one entity or region, regardless of its vastness. Textual components within the tourism discourse such as ‘‘Queensland is home to Australia’s ocean jewel, The Great Barrier Reef and the spectacular Whitsunday Islands’’ (Elizabeth E II), ‘‘[t]wo destinations, ‘‘Wonder Wall’’ on [the] Outer edge of Upolu Reef and Upolu Cay Reef [will be visited]. Both of these are located within the Great Barrier Reef Marine Park and provide visitors with remarkable encounters with colourful corals and a diverse array of marine life’’ (Ocean Freedom),

> Upolu Cay Reef diving allows you to swim around a pretty, colourful coral garden, which makes an amazing contrast to the surrounding white coral sand patches. Look out for stingrays hiding under the white coral sand and turtles having a feed. There’s many different types of smaller reef fish darting in and out of the corals, Parrot fish grazing on the algae and coral trout swaying lazily amongst the coral (Ocean Freedom)

or yet again,

> Australia’s Great Barrier Reef offers you the opportunity to explore an enchanting underwater world that is bursting with colour, life and home to unique and interesting residents. It’s an adventure destination like no other, one that will call you back again and again (Elizabeth E II)

provide descriptions of the GBR as one entity as opposed to an ecosystem made up of several ecosystems, regions and habitats. As such, through statements such as the above, the tourism discourse occasionally adopts a whole-of-region bio-geographic approach. While the tourism discourse, in this sense, seems to adopt a bio-geographic angle in describing and painting a representation of the GBR, the message communicated, regardless of the region or bio-geographic area in question, and regardless of the size of the latter, remains consistent in that the GBR is always described and represented as an ecosystem filled with life, beauty and colour. As such, despite it using textual elements which vary regarding bio-geographic size, scale and specificity, the tourism discourse remains consistent in incorporating textual components that focus on showcasing the Reef's aesthetic attributes, which in turn communicates the message that the GBR is also filled with life, colour and beauty. In utilizing components focused on aesthetic attributes which are closely aligned in assessing ecosystem health, the tourism discourse therefore ultimately utilizes a unified and consistent message to communicate that the Reef is alive, colourful, filled with plenty of life, and thus worthy of tourism.

5.3 What's hiding below the surface? Images used to acknowledge the existence of climate change

Regardless of bio-geographic scale, the tourism discourse utilizes several textual components that focus heavily on colour, life, and beauty, while also specifically describing the GBR's coral, reefs and marine life. Indeed, much of the tourism discourse's textual elements, especially those which

reference colour, are specifically related to reefs and coral. Combining the latter with the fact that the word ‘‘reef’’ was used 7549 times and that the word ‘‘coral’’ was used 2870 times making them the two most frequently used words within the tourism discourse, and which in turn respectively makes up 3.35% and 1.27% of the discourse’s 500 most frequently used words, evidently shows that reefs & coral, and its associated colours, are at the forefront of the tourism discourse’s textual elements. The discourse’s visual components, however, are not heavily comprised of especially strikingly colourful reefs and coral. While some images within the tourism discourse display colourful, vibrant, large, and diverse reefs and coral (Figure 5.1), most images of reefs or coral do not display much vibrancy nor striking colours. In this way, while the colourful reefs and coral make up a large part of the tourism discourse’s textual components, they do not seem to be the focus of the same discourse’s visual elements. Thus, while the reefs and coral are often present in the underwater photographs that are included within the tourism discourse, these images do not seem to have undergone visual effects/touch-ups where colours or sizes have been manipulated. Instead, the pictured reefs and coral are often cream, brown and beige coloured. Indeed, the coral being beige-brown coloured in the photos allows for them to blend in with the Reef’s sediment and sand or make up the image’s background where the attention is focused on fish, turtles, other marine life, or tourists scuba diving/snorkelling (Figure 5.2).

Figure 5.1 Images of the GBR's colourful and vibrant coral used within the tourism discourse

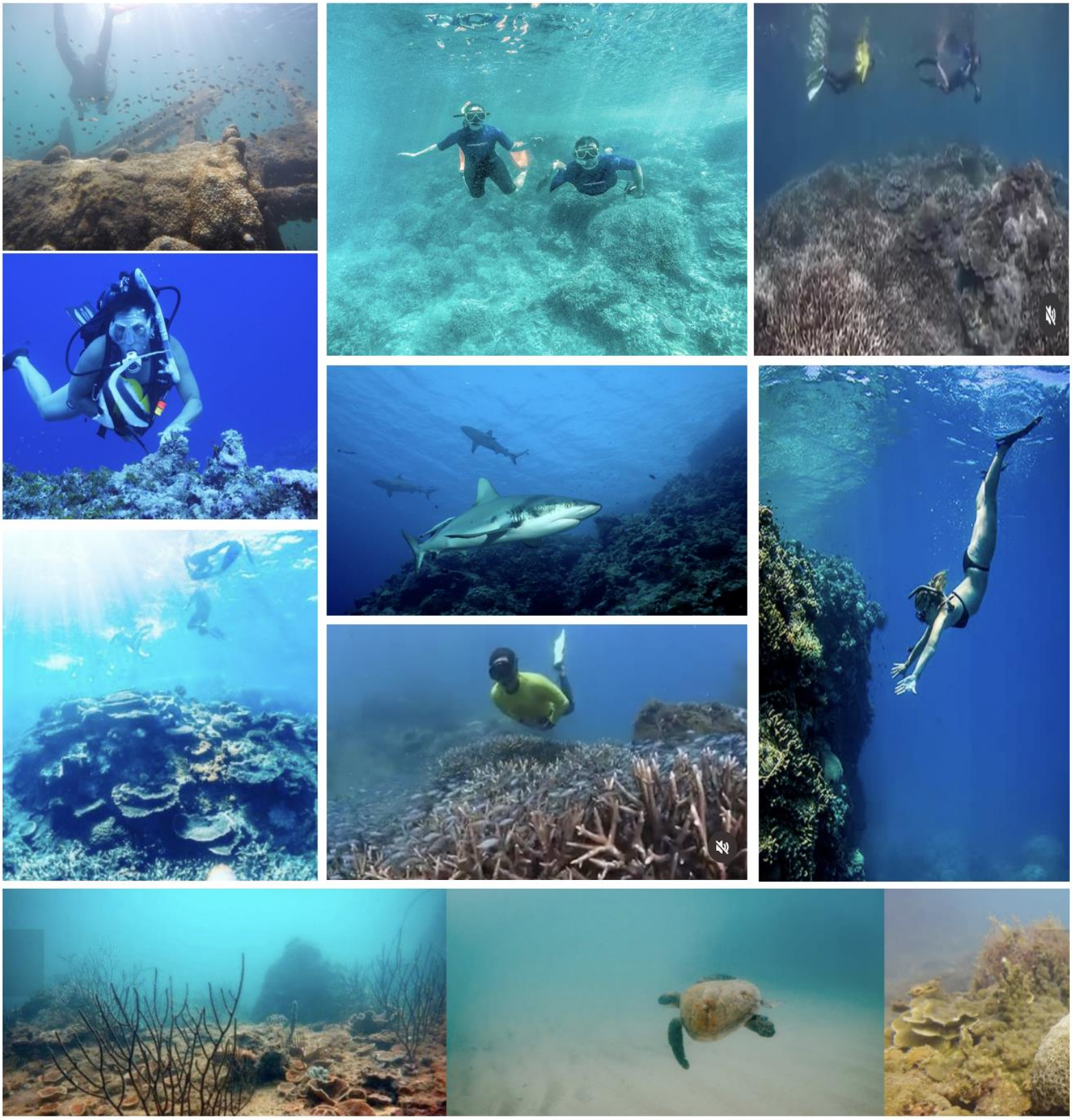


Figure 5.2 Images of non-vibrant coral used within the tourism discourse

Interestingly, underwater photographs make up a rather small part of the tourism discourse's visual components. Instead, the discourse's visual elements focus heavily on landscapes which are oftentimes accompanied by tourists or tourism vessels (boats, kayaks, pontoons, etc.). As such, the coral depicted within these photographs, and thus within a large portion of the tourism discourse's textual elements, is often pictured from above the water's surface. Importantly, while the colourful/vibrant coral does not make up the primary focus of the tourism discourse's visual components, the latter always display some sort of GBR-specific life, whether it be rainforests, trees, plants, birds, fish, turtles, other marine life or non-colourful coral. While GBR-specific marine and coastal life through nature, vegetation, or animals is oftentimes present in the discourse's photos, just like the colourful coral, it is not the primary focus. Indeed, the focus of the visual elements present within the tourism discourse is tourism. In making tourism the major focus of its photographs all while always ensuring that some life, whether it be coral, coastal vegetation, fish, or other wildlife, is always incorporated, the tourism discourse ultimately seems to communicate the GBR and its wildlife support tourism.

Through utilizing photos that depict tourism as the primary focus all while ensuring that some sort of marine or coastal life is always present, the tourism discourse can communicate more than the simple fact that tourism is at the forefront, however. In fact, by adopting photos that display marine and/or coastal life on the GBR all while ensuring that the latter is either pictured from above the water or present within the photo's background (especially through the use of landscape or aerial photographs), and is ultimately not the main focus of the photos at hand (Figure 5.3), the tourism discourse is able to leave a gap for the scientific discourse which communicates the overall message

that the GBR is severely negatively affected and undergoing serious biological, ecological and physical transformations due to the effects of climate change. Utilizing photos that display wildlife, vegetation, and especially coral either from afar or above the water's surface allows the tourism discourse to ultimately communicate that there is life on the Reef all while avoiding the need to communicate the ways in which climate change has and continues to negatively affect this Reef life. As such, the tourism discourse, through putting tourism at the forefront all while including wildlife from afar, can further promote tourism without specifically divulging the negative effects climate change has on the GBR, but also without completely ignoring or combatting the scientific discourse's message that the Reef is suffering from climate change. Thus, through its strategic approach of mostly avoiding the utilization of pictures of pristine underwater coral ecosystems, all while still utilizing wildlife and nature components within the images provided, the tourism discourse is able to ultimately communicate that the Reef (even if just in part) is filled with life and beauty all while providing a gap for the scientific discourse, which in turn promotes the message that there is an acknowledgement of the presence of climate change, its disturbances and overall negative effects to the Reef's ecological health. In combining the textual components of the tourism discourse which focus heavily on the GBR's aesthetic beauty, colour and presence of life in both pristine and idyllic ways with its visual counterparts, which put tourism at the forefront, always include coastal or marine life, but also avoid focusing on portraying *pristine* or *idyllic* marine life (especially coral), divulge the message that climate change is present on the Reef, but that overall, the Reef is ''fine''.

Figure 5.3 Tourism as the main focus in the tourism discourse's visual components

5.4 The Reef is fine! Using a bio-geographic approach to combat climate change as a threat to tourism

The tourism discourse strategically utilizes idyllic language and textual elements in addition to images that mostly focus on landscape, above-water, and tourism-related components to create an aesthetically pleasing representation of the GBR. Importantly, the tourism discourse also utilizes visual elements to allow discursive space for climate change, such as including under-water photographs where coral is undoubtedly alive but oftentimes blends in with the background or sediment (Figure 2). While the textual elements found within the tourism discourse regarding the Reef are mostly idyllic, the discourse also utilizes specific language to discuss climate change within the GBR Region. To do so, the tourism discourse seems to adopt a bio-geographic textual approach to communicate that the GBR, as a whole-of-Region, has been and continues to be subject to climate change but that *most* of the Reef is ecologically healthy and therefore *most* of the Reef retains its aesthetically pleasing attributes such as containing a plethora of colourful, vibrant, and diverse coral and marine life. Indeed, textual components found on ABC Snorkel Charters' website communicate the idea that despite mass amounts of coral bleaching and increased effects of climate change, the Reef remains beautiful and worthy of visitation. Throughout their web pages, ABC Snorkel Charters states

> [t]he Great Barrier Reef is alive! There's been no shortage of bad press and some seriously misleading media coverage. You need only look at our photos, Facebook and Instagram pages to see that the Reef is still an incredible place. Rest assured the Reef is still amazing. Coral bleaching has occurred. It's a natural event actually. But the Reef is big and the bleaching is comparatively small. There's still many beautiful locations to explore with ABC Snorkel Charters. Has the Great Barrier Reef suffered from coral

> bleaching in recent years? Yes, there's definitely been some damage, but the Reef covers a massive area and mortality has not been uniform. Media claims that 93% of the Reef is dead is simply not true. Many areas remain absolutely stunning. (…) With our small vessel and roaming permit, we'll take you to some pristine snorkelling sites on Port Douglas' Outer Reef. Where you'll explore coral gardens, abundant with life and colour. Our Reef is healthy and beautiful (ABC Charters).

In adopting a similar bio-geographic approach to showcase the colours, life and beauty of the GBR, Aroona Luxury Boat Charters communicates that ''[t]he Far Northern Great Barrier Reef is a remote and rarely visited wilderness, the majority of the reef in the area is outstanding, with amazing reef life, and great coral cover'' (Aroona Luxury Boat Charters, 2023). Similarly, in referencing one specific area of the GBR, SeaLink Queensland (2021) states that ''[t]he isolation and beauty of this part of North Queensland is just as striking as it was in the early years''. Further, Tourism and Events Queensland affirms that the GBR is

> [a] complex yet fragile ecosystem. The Great Barrier Reef not only needs careful management and conservation, but also visitors to come and experience the World Heritage-listed wonder in all her glory. Although some areas of the Reef require additional conservation measures, there are so many parts that continue to thrive in colour and biodiversity (Tourism and Events Queensland, 2023).

Throughout these types of communications, the tourism discourse adopts a universal bio-geological approach to communicate that *some parts* of the GBR have undoubtedly been negatively affected by the effects of climate change, and in particular by coral bleaching, but that *the majority* or at least *many* of the Reef's areas remain in healthy and therefore

aesthetically pristine conditions. In this sense, the tourism discourse acknowledges the effects of climate change on the GBR but seems to minimize the latter's extent. Nonetheless, by using this strategic bio-geological approach, the tourism discourse provides a space for the existence of the scientific discourse within its own. Importantly, however, this indirect way of acknowledging the presence of climate change on the Reef does not translate into much climate change specific communications by the tourism discourse. Instead, the latter focuses heavily on describing and thus painting representations of the Reef's healthy components, regions and areas. However, the very idea of simply divulging that many areas of the Reef remain healthy and beautiful evidently suggests that there are other areas which are and continue to be severely affected by climate change and which are therefore not in ideal or pristine conditions.

Very little detail, other than simple statements acknowledging their existence, are provided regarding the areas of the Reef that have undergone negative transformations and that are continuing to lose resilience due to climate change, however. In this sense, the tourism discourse's textual components, despite acknowledging the presence of climate change through these types of textual communications, paint a particularly healthy and aesthetically pleasing representation of the GBR. Combining the use of this communication strategy where the effects of climate change on the GBR's ecological integrity and resilience is indirectly acknowledged, in combination with the fact that the discourse leaves room for the interpretation of the presence of climate change on the Reef through the use of non-colourful coral images or with the use of images focused on above-water landscapes

or scenery all while still ensuring that beauty and life are portrayed, demonstrates that the tourism discourse ultimately focuses on creating aesthetically pleasing representations of the Reef. In turn, the tourism discourse creates a representation of the Reef as an ecosystem worthy of continued tourism.

Utilizing both communications and images that indirectly acknowledge the presence and impacts of climate change on the ecosystem, all while mainly focusing on the healthy and aesthetically pristine parts of the Reef, evidently shows the tourism discourse's vested interest in promoting the continuation of tourism on the GBR. In fact, tourism operators acknowledge that the Reef's continued existence is necessary to ensure continued tourism business, and even suggest that continued tourism is the main motivation for protecting the ecosystem, as suggests ABC Snorkel Charters Port Douglas through web communications such as

> [w]e protect the Great Barrier Reef at ABC Snorkel Charters Port Douglas. It's at the core of our operation and all that we do. Why? Apart from the incalculable intrinsic value, we are very directly reliant on a healthy Reef for our existence as a company. We understand the Reef is a fragile ecosystem, subject to numerous threats. We are thrilled to be in a position to conduct a minimal impact Reef operation. At ABC Snorkel Charters we provide small number Reef trips, big on experience (ABC Snorkel Charters).

By providing idyllic communications where the Reef's colours, diversity, and marine life are at the forefront, in addition to providing images which focus on displaying marine life and idyllic scenery or landscapes, the tourism discourse can divulge the message and create the representation of a healthy and beautiful GBR. In turn, this message and representation ultimately communicate that the Reef is a place worth visiting, therefore further showcasing the discourse's vested interest in the promotion of Reef tourism. Moreover, the tourism discourse's overall acknowledgement of climate change on the GBR not only gives space for the scientific discourse to exist within the tourism discourse, but also allows for the tourism discourse to utilize climate change to further promote tourism through new offerings such as visiting research stations or offering tourists educational products *in situ.* Through utilizing climate change as a tourism product, the latter no longer exists as a threat to the industry but rather as a force to further promote tourism. Thus, while simultaneously focusing on painting a pristine image of a healthy Reef and indirectly acknowledging the existence of climate change, the tourism discourse can ultimately use climate change as a product to further drive *in situ* tourism.

5.5 Selling climate change as a tourism product

By acknowledging climate change on the GBR, the tourism discourse can utilize it to promote Reef tourism. The tourism discourse's acknowledgement of climate change is often accompanied by

language suggesting that GBR-specific climate change education provided through tourism will lead to its preservation and protection. Importantly, the textual elements found within the tourism discourse ultimately communicate that tourists can play an important role in Reef conservation specifically by the participation of *in situ* education through tourism. Communications found on tour operator websites such as

> ABC is committed to ensuring you have the best Great Barrier Reef experience, with the lowest possible impact on the environment. (…) We'll show you how to protect the Reef during your visit. You'll explore stunning coral gardens, teaming with abundant marine life. Learn more about the environment with enthusiastic marine interpretation and presentations by our crew. The Great Barrier Reef is an international and tourism icon. See it with us, a small local business (ABC Snorkel Charters)

or

> at Aquascene, we demonstrate our commitment to tourism excellence in our everyday practices. We deliver a high-quality nature-based tourism experience with strong interpretation values, commitment to nature conservation and reinvestment into our local community. We strive to educate our guests, in an enjoyable and engaging delivery, of our message of conservation to preserve this very special place we call home. By working together, our industry can help protect our amazing planet and preserve its natural wonders. Aquascene likes to encourage all of our guests to spread conservation messages on their return home and be active in taking steps to live greener lifestyles (Aquascene – Environment).

both state that learning about GBR conservation in the face of climate change is provided during the tourist's on-site visit. Within these types of communications, which are found numerous times

throughout its entirety, the tourism discourse ultimately divulges the message that *in situ* tourism is required to gain an understanding of the effects of climate change on the GBR. As such, the tourism discourse first communicates that Reef-specific climate change education is provided and most effective *in situ* and further that this on-site education leads to the ecosystem's conservation and protection. It can therefore be deduced that the tourism discourse communicates that tourists can protect and preserve the GBR through its tourism and that the discourse therefore ultimately promotes on-site GBR tourism to combat climate change. While the tourism discourse utilizes climate change education to drive *in situ* Reef tourism, it also makes use of climate change education to develop new types of tourism or tour offerings.

In combining education and the fact that the GBR is a threatened ecosystem because of climate change, the tourism discourse is able to generate revenue through the creation of specific climate change education tourism on the Reef. One of the most common strategies adopted by the tourism discourse is to sell tourism products that involve the participation of scientific professionals such as marine biologists or Master Reef Guides. In particular,

> Master Reef Guides are recognised as the world's leading reef guides, interpreters and story tellers sharing the wonders of the Great Barrier Reef World Heritage Area. These reef ambassadors can provide up-to-date information on the Reef, share stories of the magical World Heritage Area, and explain what you can do to make a difference. The Master Reef Guide program is delivered by the Great Barrier Reef Marine Park Authority, Association of Marine Park Tourism Operators and Tourism and Events Queensland and is the first of its kind for the Reef (Great Keppel Island Watersports and Activities – Master Reef Guides, 2023).

By employing Master Reef Guides, marine biologists or other individuals with scientific expertise, the tourism discourse can further promote on-site climate change education through Reef tourism participation via various activities like Sailaway's guests who ''have the opportunity to snorkel in the lagoon of the island with our marine biologist who guides them on an interesting and informative Guided snorkel tour'' (Sailaway Port Douglas – Reef Destinations). Thus, communications found within the tourism discourse such as

> Master Reef guide Nat is filled with a devoted passion for our Great Barrier Reef and believes all it takes is one person to make a difference. Educating us about the intricacies of the thriving life both above and below the surface, Nat's enthusiasm and love for our backyard will have you bubbling with anticipation to get out and experience the reef for yourself (Bundaberg Region, Reef Health, 2023),

> [w]ith complementary informative Glass Bottom Boat and Adventure Drift Snorkel Tours, led by our passionate, knowledgeable Master Reef guides and Marine Interpreters, you will engage and learn about the reef and then, we have no doubt, start to feel this deep connection to nature that we all share (Cairns Premier – Reef Sites, 2023),

and

> Dr Adele is the chief scientist. She'll be putting to good use her more than a quarter of a century of experience as a teacher and marine researcher to guide your adventure.

> She's led research expeditions to some of the remotest locations on the planet. Now it's your chance to join Dr Adele out on the Great Barrier Reef and learn about one of the seven natural wonders of the planet. (…) Snorkel the pristine waters of the Great Barrier Reef with our world class marine biologist Dr Adele (Great Barrier Reef Safaris – About us, 2023),

promote tourism by communicating to potential tourists the idea that participating in this type of tourism activity will ultimately lead to their greater understanding of Reef health and impacts given that the information will be provided by a credible source. In addition, promoting tourism programs led or accompanied by individuals with scientific knowledge and background delivers the message that this type of tourism is sustainable, approved by the scientific community, and will lead to tourists and tourism facilitating the Reef's overall increase in ecological health. In fact, the tourism discourse goes as far as to clearly state that the tourists' participation in Reef tourism *will* (not may) help change the GBR's declining health through language such as

> [h]ave fun snorkelling and learning about the UNESCO World Heritage Listed Great Barrier Reef, while you contribute directly to its future. During this tour you will discover the underwater beauty of the Keppel's, and take part in Citizens Science and research to help make a change. The data collected will be submitted by yourself and your guide, collecting valuable information that scientists and reef managers will have access to, meaning you are contributing directly to the health and protection of the reef. You will follow and assist our Master Reef Guides and Eye on the Reef trained staff in a small and informative tour. Here are some examples of the citizen science activities you can expect to participate in during your tour: gain local area knowledge specific to the Keppel reefs and its history, assist our Master Reef Guides and Eye on the Reef trained staff as they survey reef locations and monitor reef health, complete Sightings Network submissions and Rapid Monitoring or Tourism Weekly Survey Reports for the Great Barrier Reef Marine Park Authority as part of the Eye on the Reef network (Great Keppel Island Watersports and Activities – Reef Ranger Tour).

Tourists may feel as though participating in activities led by individuals with scientific knowledge gives their tourism experience, and therefore seeming contribution to the Reef's ecological protection, credibility. Importantly, tourists may feel an even greater sense of credibility by participating in tourism activities through a company owned and operated by scientific knowledge holders such as marine biologists. Thus, the tourism discourse utilizes this strategy to further promote tourism through statements such as

> Wavelength is owned by local marine biologists and virtually all the crew are marine biologists, so naturally we strongly believe in a partnership between ecotourism and science. Our main interests are coral health and the adaptive capability of coral to cope with warming waters, whilst we hope for stronger climate policies. Wavelength operates the largest research coral nursery on the Great Barrier Reef with the scientific guidance of UTS [University of Technology Sydney]. We have assisted in varied research projects by providing reef access to researchers (Wavelength – Conservation).

As such, by utilizing scientific experts to either deliver or organize tourism programs, the tourism discourse can harness climate change as a product and ultimately drive tourism on the GBR. Moreover, the tourism discourse makes use of climate change as a tourism product via restoration and monitoring partnerships, programs, and initiatives with the Great Barrier Reef Marine Park Authority (GBRMPA) and other government and/or scientific agencies. In doing so, the tourism discourse has created voluntourism and/or science tourism, which is further addressed through statements telling tourists they

> can also get involved with organisations such as Citizens of the Great Barrier Reef, Reef Check Australia, Reef Teach and the Great Barrier Reef Foundation, many of which offer voluntourism opportunities to help clean up the Reef, monitor wildlife and collect invaluable data. Many tourism operators also encourage guests to act as ‘‘citizen scientists’’ to report observations and wildlife sightings via the Eye on the Reef app (Malanda Falls – Caring for the Reef).

In specifically addressing the Eye on the Reef program, the tourism discourse states that the

> Eye on the Reef is a reef monitoring and assessment program that enables anyone who visits the Great Barrier Reef to contribute to its long-term protection by collecting valuable information about reef health, marine animals and incidents. The marine tourism industry is a key partner in the protection and management of the Great Barrier Reef. Tourism operators help enhance visitor experiences of the Reef and play an important role in protecting the amazing biodiversity that supports their industry (Sailaway Port Douglas – Environmental Initiatives).

Importantly, the tourism discourse, through the utilization of Citizen Science programs such as the Eye on the Reef program, can further promote tourism by using climate change. Through implementing these programs, the tourism discourse invites tourists to participate in educational *in situ* outings with an everlasting promise that they will in turn help save the Reef. In this sense, the tourism discourse ultimately communicates that tourism is the *cure* to the GBR's ecological decline and overall negative health status. It is important to note that this type of tourism would not exist without the presence of climate change and its effects on the GBR. Thus, it is evident that the tourism discourse has harnessed Reef-specific climate change to develop tourism programs and

ultimately drive increased visitation. Tourists' participation in monitoring programs extends beyond the Eye on the Reef program. Indeed, as communicates Sailaway,

> Sailaway is one of five Marine Tourism Operators participation in the Coral Nurture Program. This is a new approach for the Great Barrier Reef that is initiated by a partnership between tourism and science. A core objective of this program is to introduce coral planting into localised stewardship and adaptation. This is to help ensure sustainable reef ecotourism and promote education on the major threats to coral reefs and possible solutions. This involves out-planting corals in order to boost live coral cover at reefs that have experienced a fall in cover and also helps ensure reef sites with existing high coral cover that are economically valuable stay healthy. (…) A core objective of this program is to introduce coral planting into localised stewardship and adaptation. This is to help ensure sustainable reef ecotourism and promote education on the major threats to coral reefs and possible solutions, which involve the whole community (Sailaway Port Douglas – Environmental Initiatives).

Through the Coral Nurture Program, tour operators such as Sailaway can utilize the tourism discourse to attract potential tourists in visiting the GBR *in situ* by ultimately using climate change and tourists' concern about climate change as a tourism product. Indeed, communications such as

> CONCERNED ABOUT OUR REEF? TRY ONE OF OUR ECOTOURS. We all know reefs around the world are under grave threat. So we are offering you an opportunity to become involved in helping to save our Great Barrier Reef by taking part in one of our ecotours. We are offering group charters on Providence (an excellent alternative for schools; higher education sector or anyone interested in curricula enhancement). Or you can jump on board our beautiful MiLady and spend a day monitoring coral, collecting and identifying marine debris and identifying weeds, and then a day of relaxing on the beautiful Whitehaven Beach (Providence – MiLady)

found within the tourism discourse showcase the fact that it is the tourists' concern regarding climate change that particularly drives the establishment of climate change specific tourism on the GBR. Aside from utilizing Master Reef Guides or marine biologists to educate tourists on climate change, doing so through tourists' involvement in monitoring programs seems to be the most prominent method of attracting tourists to visit the GBR *in situ* via the specific utilization of climate change. Another common way in which the tourism discourse utilizes climate change to promote tourism on the GBR is by conducting visits at specific research stations where climate change and reef health are at the forefront of operations. Indeed, statements found within the tourism discourse such as

> [t]o ensure our guests are exposed to and educated about the challenges and the opportunities faced by the Great Barrier Reef, we work closely with the Lizard Island Research Station, a world-leader in coral reef education and research, to protect and preserve the Great Barrier Reef and most recently pioneering successful techniques to combat the spread of one of the reef's biggest predators, the Crown of Thorns. We offer guest tours of the Research Station where they have the opportunity to speak to marine staff who live and work in the surrounds, who can provide insights on the day to day health of the marine environment as well as advances in reef conservation and research breakthroughs (Lizard Island – Sustainability)

not only highlights the use of climate change to drive GBR *in situ* tourism, but rather highlights the scientific knowledge and evidence of GBR-specific climate change to ultimately promote its tourism. While the tourism discourse uses climate change to create specific types of tourism on the GBR, such as educational tourism through Master Reef Guide or marine biologist led tours, voluntourism through Citizen Science programs such as the Eye on the Reef program or through visiting research stations specifically dedicated to understanding and investigating the effects of

climate change on the GBR, it is important to note that the discourse does not directly use the words ‘‘climate change’’ when discussing these programs and new tourism offerings. In fact, climate change remains mostly unaddressed in most of the tourism discourse’s communications regarding these new types of GBR tourism offerings. Importantly, the discourse suggests that tourists can save the Reef or can divulge conservation messages by participating in these programs but there remains one largely unanswered question regarding the tourism discourse’s communications on these programs: what are tourists saving the Reef from? The tourism discourse mentions that the Reef is threatened but rarely provides information as to what is causing this threat. Instead of providing information on the effects climate change has on the GBR’s ecological health status, the tourism discourse merely focuses on the *amazing biodiversity, stunning coral gardens, abundant marine life, pristine waters,* etc. all while simply communicating that the Reef needs saving, and that tourism can serve as the cure.

Moreover, the tourism discourse further promotes exclusivity as a tourism product which will ultimately lead to the Reef’s sustainability but yet again employs the strategy of mostly avoiding the mention of climate change. The latter can be seen through communications found within the tourism discourse such as

> [w]e strive to run very low impact kayak trips. By having a low ecological footprint on the Island and sea environments we help to continue the preservation of the wild places we are fortunate to paddle in. We therefore keep group sizes small and only allow a maximum of 13 customers per trip, however on average most trips depart with between 6 and 8 participants (Coral Sea Kayaking – General Info),

and

> ABC is committed to ensuring you have the best Great Barrier Reef experience, with the lowest possible impact on the environment. We are deeply respectful of the Great Barrier Reef. It's an amazing place and we want to preserve it for future generations. That's why we limit our numbers, use modern vessels, vary our Reef sites and destinations, and always strive to provide very low impact tours. (…) It's definitely not a numbers game with ABC we take just 8 or 12 guests, the smallest amount of any other Reef tour. There's more to it than that though. It's our commitment to provide an insightful, engaging and amazing day visiting rarely seen Reef sites. (…) Keeping our environmental footprint as small as can be, to protect our amazing Great Barrier Reef (ABC Snorkel Charters – About Us),

Yet again, the tourism discourse does not directly mention climate change and its impacts on the GBR. Instead, the tourism discourse simply communicates that exclusivity regarding number of passengers will ultimately aid tourists in preserving the ecosystem at hand. Exclusivity does not only have to do with the number of tourists present on any given tour, however. In fact, exclusivity plays a large part in areas visited, as seen through statements such as ''[a] maximum of 30 students (plus the required ratio of supervisors) will be permitted to experience an exclusive Turtle Tour and undertake turtle watching on the beach'' (Bundaberg Region – Educational Groups),

> [b]ecause of our low passenger numbers, we have the freedom to roam all the reefs off Port Douglas and Low Isles, finding new sites that are teeming with life, is just the beginning! Our totally unique micro operation in Port Douglas makes us the snorkelers' choice. You get to explore untouched coral gardens, in an intimate way, free from the crowds and without a tight schedule. We have two tours. One visits the low use reef areas off Port Douglas, which is only possible because of our low passenger numbers'' (ABC Snorkel Charters – Home),

> [w]ith exclusive access to 30 premier moorings on both the mid and outer Great Barrier Reef, visit the best dive and snorkel sites Cairns has to offer including 'The Whale, 5-Ways, Little Tracy and 3 sisters'. Our reef sites are healthy and full of diverse marine life. There are stunning coral gardens with visibility often up to 30+ m (Coral Sea Dreaming – Home),

and

> [c]ruise to pristine, secluded beaches and uninhabited islands with stunning natural scenery brimming with marine, bird and animal life. Our small group, exclusive boat tours are the only way to visit many of the Keppel Islands secret spots and the only circumnavigating boat tour around Great Keppel Island (Keppel Explorer).

However, as discovered within the managerial discourse, number of passengers and location of visits are restricted and accessed by permit as a direct result of the impacts climate change and other anthropogenic threats have had on the GBR. Given the fact that the tourism discourse markets and sells exclusivity and that exclusivity (both in terms of reduced passenger numbers and visiting locations) is a direct result of climate change, it is evident that the tourism discourse is ultimately selling climate change as a tourism product. The tourism discourse does not address the fact that exclusivity in terms of limited passenger numbers and access to certain sites is a direct result of

climate change management, however. Instead, the tourism discourse simply suggests that exclusivity is either meant to increase the tourism experience or aid in the operator's sustainability. Importantly, the latter is not elaborated within the tourism discourse. Thus, the tourism discourse disguises climate change as a purchasable tourism product: exclusivity. In being offered various tourism options (such as tours with Master Reef Guides, tours participating in Citizen Science programs, or exclusive excursions) disguised by the tourism discourse as educational and exclusive products, tourists are ultimately encouraged to purchase climate change while thinking that the latter will save the Reef. Thus, the tourism discourse places grand responsibilities on tourists regarding climate change and the GBR's preservation.

5.6 Saving the GBR: who's responsible?

As shown, the tourism discourse places a lot of responsibility on tourists regarding saving the GBR. Throughout various communications, the tourism discourse suggests that tourists can help protect, preserve, and ultimately save the Reef through participating in its tourism. Importantly, however, the tourism discourse does not necessarily provide detailed information on how participating in GBR tourism will lead to the protection of the Reef other than through participating in coral monitoring surveys or providing blanket statements suggesting that tourism will allow tourists to become more conscientious of the Reef's ecological status and that educational tourism programming will help inspire tourists to protect it and spread conservation messages, as communicates Tourism and Events Queensland (2023), ‘‘once you see the Great Barrier Reef's

precious and surreally beautiful environment for yourself, you'll instantly join the army of reef warriors who leave more educated and inspired to protect it'' and as Cairns Premier further states that as a tour operator, they value the importance of

> [e]ngaging all guests and giving them a real ''connection'' to the reef [and] – they believe – will make people want to make small positive environmental and lifestyle changes in their lives – the sum of which can lead to great outcomes. [The tour operator further states,] our take home message is for all guests to have an appreciation of the incredible coral reef and marine life, and then value and understand the importance of looking after this magnificent icon for the enjoyment of future generations (Cairns Premier – Eco).

Similarly, Southern Cross Sailing Adventures affirms

> [c]ontent will ad to visitors' understanding of the reef, enabling them to be more informed and to actively promote factual information through their networks. Our role in delivering this content is to inspire people to change their minds and their approach to the issues surrounding the reef's health. Many formats will be used in the process. These include our website, social media, brochures, webinars, and newsletter content. Making this content easy to share will empower our audience to spread the message further, enshrining the values of the reef. Success will be measured by the number of people who, after their experience, think and act differently, are more confident raising the reef health issues both privately with family and friends and through social media and other digital forums (Southern Cross Sailing Adventures – Our Commitment).

However, the tourism discourse fails to give tourists direction on exactly how they can go about protecting and preserving the Reef, especially from climate change and its effects. Instead, the

tourism discourse suggests that tourists can save the Reef by simply limiting the use of plastic water bottles, plastic straws or certain sunscreens through communications such as ‘‘[p]lease bring your own drinking bottle, we’ll supply the filtered rainwater, and your own traveller mug for hot drinks. Leave your sunscreen behind and use our REEF SAFE brand to protect the coral’’ (1770 Creek 2 Reef – Charters) and further ‘‘[m]inimising waste and recycling wherever possible on board (…) [and] no straws avoid use of single use plastics wherever possible’’ (Aquascene – Environment). Furthermore, the tourism discourse states that tourists can help protect the GBR by receiving ‘‘a detailed briefing before entering the water to ensure you won’t produce any damage to corals or other living creatures. Weak swimmers receive a lifejacket to keep them afloat at all times, so no standing or touching required’’ (Aquascene – Environment). While these messages are important, they do not address the ways in which tourists are meant to combat climate change on the GBR, nor how they can help protect the Reef from climate change. Communications regarding the latter are very few, far in between and further promote tourism on the GBR when they are present. In fact, the tourism discourse suggests that tourists can help preserve the Reef through two main methods, which include paying a reef tax or choosing an eco-certified tourism operator, as communicates Aquascene (Discovery Tour) through a statement such as ‘‘EMC Reef tax charge is included in your ticket (you are helping to maintain the World Heritage Great Barrier Reef Marine Park)’’ or communications like

> [a]ll visitors pay a ‘‘reef tax’’ which contributes to the day-to-day management and conservation of the Reef. The most eco-friendly way to enjoy the Great Barrier Reef is by booking a tour, as most operators include an environmental management charge as part of their ticket price. Look out for operators who have an EcoTourism Australia or EarthCheck certification, and just by experiencing the Reef with these operators, you’re contributing to its protection and preservation. Minimise your carbon footprint during

> your visit and choose to stay at an eco-resort on the Great Barrier Reef. There are a number of world-leading eco-tourism resorts that have fully adapted to sustainable living practices to minimise their environmental impact (Malanda Falls – Caring for the Reef)

and as affirms Calypso Reef Cruises through communications such as

> [g]uests are also encouraged to support tourism operators who have achieved the Ecotourism Certification logo. Ecotourism Australia Certification allows travellers to Australia to identify and support operators who meet the benchmark and so ensure tourism products have minimal impact to the environment (Calypso Reef Cruises – Reef Protection).

However, these statements, yet again, suggest that Reef protection is only possible *in situ* and the tourists' carbon emissions in relation to travel to the GBR as a destination is not questioned although the tourism discourse provides evidence of an understanding that carbon emissions are directly related to climate change and the Reef's ecological degradation. The latter is true given that the tourism discourse incorporates various communications where tour operators provide information as to how they have reduced carbon emissions within their day-to-day operations. Indeed, textual components such as ''[we] [u]se very fuel efficient and economical vessels, with modern diesel engines'' (ABC Snorkel Charters – Low Impact Reef Tours), ''[we] [p]addle instead of motor: we paddle the motorised dinghy over the reef (within certain distances and conditions to snorkellers) instead of having the engine running'' (ISail Whitsundays – Eco Action), ''[w]e are

committed & passionate about our environment, especially the ocean & ensure our impact is reduced. We SAIL, rather than motoring as much as we can'' (Big Mama Sailing – Home),

> [o]ur ''environmentally friendly'' vessel: using energy efficient devices wherever possible. Installation of solar panels on board Aquascene. Aquascene is powered by solar power for anchor winch and electrical system on board. Our vessel has ultra low engine emissions. Minimal engine use time resulting in lower impact to the environment. Ongoing observations of our sustainable operations, procedures and carbon footprint (Aquascene – Environment),

> [e]xperience Co is committed to establishing an emissions baseline to assess our impact and make meaningful changes to improve. (…) Experience Co is committed to minimizing adverse impacts on the environment, promoting environmental stewardship and reducing carbon emissions (Calypso Reef Cruises – Reef Protection),

and,

> ISail Takes Action Against Climate Change. Rising sea temperatures could potentially threaten our marine friends. Talk to our staff about Climate Change, we are passionate about the topic. Our tours have minimal climate impact, the overall fuel usage is 3 litre per person per day. As we are limited to water tanks, we use extremely little water during a trip (ca. 25 l per person per day). This includes the power consumption during the trip, sail boats are very power efficient and ISail uses low energy appliances and light globes, no toasters, hairdryers or other high energy consumers. You will have your lowest carbon footprint during your ISail Whitsundays tour: 0.14 tCO@e per person/tour. Offeset your ISail Whitsundays tour with either Climate Friendly (0.14t) or Cleaner Climate (2 tour days) (ISail Whitsundays – Eco Action)

are but a few examples showing that the tourism discourse is aware of the importance of reducing carbon emissions as a means to protect the GBR from the effects of climate change. However, despite understanding the importance, the tourism discourse does not address the need for tourists to reduce their tourism-related carbon emissions. In fact, the only three textual components which make reference to the latter simply suggest that tourists will have low carbon footprints by attending tours offered by a certain tour operator (seen in the last reference by ISail), therefore once again suggesting that *in situ* tourism is necessary to aid in the GBR's protection, and that local students can learn about climate change on the Reef. Indeed, Down Under Cruise and Dive affirms that

> Cairns is the gateway to the Great Barrier Reef, the oldest Rainforest in the world, the Cairns Tablelands and the iconic Aussie Outback. With easy access to these UNESCO World Heritage sites on our doorstep, Cairns region is the perfect one stop destination for domestic and international students and groups who want to learn, contribute and make a positive environmental impact on the world (Down Under Cruise and Dive – Schools Educational Tours Cairns).

Further, Calypso Reef Cruises communicates that

> Experience Co's GBR Biology team tailor Reef Education programs which specialize in connecting local students to reef systems via curriculum-based projects and research opportunities. Community understanding and stewardship can harness increased political and community action and support for the reef's long-term protection (Calypso Reef Cruises – Reef Protection).

While these communications seem to suggest that local individuals can take part in environmental stewardship in Reef protection, they ultimately promote on-site tourism. Importantly, touring the GBR typically requires lengthy travel, even for local individuals. Thus, by promoting *in situ* tourism, the tourism discourse is also promoting lengthy travelling, which ultimately results in the promotion of carbon emissions. In turn, the latter contributes to climate change negatively affecting the Reef's ecological health, thus reducing its protection.

CHAPTER 6
RESULTS – THE SCIENTIFIC DISCOURSE

6.1 The scientific discourse

Comprised of published peer reviewed scientific articles by independent researchers, universities, or other research institutions, the scientific discourse makes up one of the three largest discursive channels, along with the managerial discourse and the tourism discourse, on the topic of the Great Barrier Reef (GBR). The scientific discourse provides a fundamental understanding of the ways in which global and anthropogenic climate change are affecting the GBR's functioning, integrity and resilience as an ecosystem. Given that the GBR is one of Australia's most important economic assets generating revenue through tourism and commercial use, its integrity, perennity and resilience to threats such as those posed by climate change are crucial to its continued existence and use (GBRMPA, 2019). As such, through providing critical information on the Reef's ecological state in the face of climate change, both the managerial discourse and tourism discourse may utilize the information provided through the scientific discourse. Understanding the ways in which the scientific discourse creates representations of the GBR, an ecosystem threatened by the effects of climate change, will provide an insight as to how this discourse contributes to the GBR's overall discursive ecosystem. In turn, the discursive ecosystem provided by the scientific discourse may directly affect the ways in which both the managerial and tourism discourses frame their own representations of the Reef. Thus, understanding how the scientific discourse utilizes textual

elements to frame representations of the GBR can in turn influence the ways in which the managerial and tourism discourses create their own representations of the ecosystem in question.

6.2 Colour or lack thereof: a bleached Reef

As seen throughout the previous two chapters, colour makes up a major theme within both the managerial and tourism discourses, where the presence of colour (especially vibrant colours) is associated with the presence of life. While the theme of colour is also existent within the scientific discourse, it is presented in a much different context. Indeed, both the managerial and tourism discourses focus on vibrancy and presence of colour when creating representations of the GBR, therefore creating representations of a lively Reef. Conversely, a common thread within the scientific discourse is the strong focus on the lack of colour, and rather focus on the presence of bleaching on the GBR. Importantly, coral bleaching ‘‘is used to describe the response of photo-endosymbiotic corals to the combined effects of increased temperature and light stresses. These cause the density of symbiont cells to become reduced and coral colonies to pale in colour and become white’’ (Ainsworth and Brown, 2021: R1). The whitening of the coral is due to the coral symbiosis’ cellular and physiological responses to the combined effects of increased temperature and light stresses which include loss of chlorophyll from the endosymbiotic algae within the coral host cells thus reducing its photosynthetic abilities, loss of the endosymbiotic algae from the coral host cells, death of the coral host cells and loss of coral tissues (Ainsworth and Brown, 2021: R1).

Thus, while the managerial and tourism discourses utilize colour to discuss life on the GBR, the scientific discourse utilizes colour to discuss death within the very same ecosystem, thus presenting a striking contrast between discourses. Importantly, lack of colour, or bleaching, is present in practically every article within the GBR's scientific discourse. The latter includes several communications on the Reef's colour, or lack thereof, such as

> Australia's Great Barrier Reef (GBR) has experienced an unprecedented sequence of three mass coral bleaching events in the last five years, intensifying concerns over the impacts of climate change on the ecosystem. Coral bleaching is one of the most striking manifestations of marine heatwaves and can cause mass coral mortality over thousands of hectares within a few months. (…) Notably, the area affected by severe warming (DHW ≥8) that can elicit mass coral mortality exceeding 66% has increased rapidly to cover 40% of the entire GBR in 2022 (Cheung *et al.*, 2021: 5385),

> [t]he global bleaching event of 2015/2016 affected 75% of Indo-Pacific coral reefs, including 84% of Australia's tropical reefs (Hughes et al. 2018a). During this event, reefs in Australia's Great Barrier Reef (GBR) and Coral Sea were exposed to up to 14 °C-weeks, causing extreme bleaching and mortality throughout the region (Hughes et al. 2017, 2018a) (Harrison *et al.*, 2019: 714),

> [t]he Great Barrier Reef has experienced mass bleaching 4 times in the past 20 years, and it is projected by climate models to bleach twice each decade from 2035, and annually after 2044, under a business-as-usual scenario for greenhouse gas emissions (Hughes *et al.*, 2019)

and

> [t]he 2014-2017 global-scale coral bleaching event (GCBE) resulted in very high coral mortality on many reefs, rapid deterioration of reef structures, and far-reaching environmental impacts. (…) Heat stress and bleaching both play a role in subsequent disease, which plays a key role in mortality (Eakin, Sweatman and Brainard, 2019: 539).

Coral bleaching results in coral starvation and damage to the animal's cells and tissues, which therefore results in the coral's reduction in energy reserves for reproduction (Ainsworth and Brown, 2021: R1). Furthermore, consequences of bleaching range from reduced colony growth, diminished reproductive ability, coral mortality, loss of the three-dimensional reef structure, phase shifts to algal dominated reef systems and therefore an ultimate decline in coral cover and reduction in coral diversity & other reef-dwelling organisms (Ainsworth and Brown, 2021: R1). While the overall effects of coral bleaching through climate change may differ across different regions of the GBR (as discussed in section 6.1.4), the fact that the scientific discourse makes zero reference to the presence of colour in the coral or organisms other than white (bleached) coupled with the fact that bleaching is associated with loss of coral resilience and increased coral mortality suggests that the scientific discourse, through the use of colour, creates an overall negative or ecologically threatened image of the GBR. The latter is especially apparent as the scientific discourse utilizes textual elements to provide evidence on the abundance of bleaching throughout the Reef.

6.3 Abundance or lack of abundance? That is the question.

While both the managerial and tourism discourses utilize visual and textual components to create abundantly life filled representations of the GBR, the scientific discourse's use of abundance is much different. Indeed, the managerial and tourism discourses utilize the theme of abundance in a positive light where abundance is associated with the presence of life on the Reef. In contrast, the scientific discourse utilizes abundance to provide evidence that the GBR's ecological resilience and health are at risk of further decline. More specifically, the scientific discourse utilizes abundance as a measure of the GBR's ecological status and resilience where, for example, ''[c]oral recovery (the restoration of abundance and composition of coral communities) after disturbance is a key process that determines the resilience of reef ecosystems'' thus highlighting that in this case, the abundance of coral composition and communities is a direct reflection of the Reef's ecosystem resilience (Sato *et al.,* 2018: 431). Throughout the scientific discourse, words directly related to abundance were used 2456 times under various negative lights. To begin, abundance within the scientific discourse is strongly related to coral bleaching events where the latter affirms that

> [t]he severity of bleaching events is typically correlated with the intensity and duration of marine heat waves that are measured as degree heating weeks (DHW, °C-weeks) (e.g. Liu *et al.,* 2014, Hughes *et al.,* 2017). As global warming has progressed (Lough *et al.,* 2018), and the length and frequency of marine heat waves have increased (Oliver *et al.,* 2018), so too has the geographic and ecological footprint of mass bleaching events (Hughes *et al.,* 2018a). The occurrence of mass coral bleaching has increased steadily since initial reports of widespread coral bleaching in the early 1980s (Glynn, 1984; Fisk and Done, 1985). Since the first reports, coral bleaching events are occurring more frequently and are increasingly severe (Hughes *et al.,* 2018a) (Harrison *et al.,* 2019: 714).

As such, the presence of coral bleaching on the GBR is evidently abundant and therefore presents the ecosystem with further threats in terms of resilience and survival through impacting the abundance of coral within the Reef. The scientific discourse provides evidence that coral bleaching directly impacts abundance of juvenile coral within the ecosystem (Álvarez-Noriega *et al.*, 2018: 527). Indeed, through a study undertaken by Álvarez-Noriega *et al.* (2018), the scientific discourse shows that declines in juvenile coral abundance following beaching events ‘‘were lower at sites closer to the 20-m-depth contour and higher for *Acropora* and *Pocillopora* juveniles than for other taxa. Juveniles of *Acropora* and *Goniastrea* were less susceptible to bleaching than adults, but the opposite was true for *Pocillopora* spp. And taxa in the family Merulinidae’’. Through this communication, abundance is treated as a measure to indicate the negative effects of climate change on the GBR ecosystem.

In addition to focusing much of its discussion on abundance of bleaching coupled with abundant losses of coral on the GBR, the scientific discourse provides evidence to focus attention on the abundance of bleach-related coral diseases. In fact, Eakin, Sweatman and Brainard (2019) affirm that ‘‘[h]eat stress and bleaching both play a role in subsequent disease, which plays a key role in mortality’’. Indeed, as state Brodnicke *et al.* (2019) within their study on the links between heat stress, bleaching, and coral disease, ‘‘[i]n addition to bleaching, warming thermal anomalies have been linked to a number of coral diseases that can result in partial or whole-colony mortality and ultimately reduced abundance at the population level (Green and Bruckner 2000; Willis *et al.*, 2004; Work *et al.*, 2012; Peters, 2015). (…) On the GBR, white syndromes (WSs) are a prevalent disease

affecting a broad range of coral species, particularly in conjunction with heat stress events (Willis *et al.,* 2004; Hobbs *et al.,* 2015)''. Thus, through evidence-based facts, the scientific discourse utilizes abundance to discuss the prevalence of disease and mortality on the GBR.

The scientific discourse further presents evidence that the overall presence and associated ecosystem damage of the coral-eating Crown of Thorn Starfish (COTS, *Acanthaster* species), because of ocean warming is becoming increasingly abundant on the GBR. Through specific studies, the scientific discourse utilizes abundance to discuss the prevalence and success of COTS under ocean warming and ocean acidification specific events. In fact, a study by Kamya *et al.* (2018) has shown that ocean warming and acidification may result in the abundance and benefit of COTS juveniles where the changing climate can increase the threat of the predatory starfish on the GBR. Kamya *et al.* (2018) found that both increased temperatures and acidification had independent positive effects on the growth and feeding of juvenile COTS. In turn, the increased abundance and performance of juvenile COTS under these conditions resulted in a significant decrease in abundance of coral (Kamya *et al.,* 2018). In an earlier yet similar study, Kamya *et al.* (2016) found that ocean warming and acidification may enhance the success of *A. planci* juvenile COTS. Importantly, the scientific discourse, through the latter study communicates that ''[i]n contrast to its coral prey, at this vulnerable developmental stage, *A. Planci* appears to be highly resilient to future ocean change. Success of juveniles in a future ocean may have carry-over effects into the coral-eating life stage, increasing the threat to coral reef systems'' (Kamya *et al.,* 2016) where COTS increased abundance will lead to the decrease in abundance of coral cover, and thus increase in abundance of coral mortality.

While the scientific discourse utilizes the textual theme of abundance to discuss how climate change has resulted in increased coral mortality, predatory COTS, and disease, the discourse also utilizes the *lack* of abundance to depict the ways in which climate change has negatively impacted the GBR ecosystem. One popular topic on the lack of abundance present within the scientific discourse is that of coral larval supplies on the GBR. Indeed, a study conducted by Cheung *et al.* (2021) has shown that cumulative bleaching in 2016, 2017, and 2020 on the GBR has reduced systemic larval supplies by 26%, 50% and 71% respectively. In fact, 75% of the severely bleached reefs on the GBR have experienced an 80% to 100% loss of larval supply, thus depicting a severe lack of larval abundance (Cheung *et al.*, 2021: 5385). As such, it is stated that ‘‘[c]oral connectivity is likely to become increasingly disrupted given the predicted escalation of climate-driven disturbances’’ (Cheung *et al.*, 2021: 5385). Similarly, a study undertaken by Graham *et al.* (2017) has shown that increased sea-surface temperatures had a direct impact on coral larvae of the common stony coral *Acropora tenuis* where increased temperature had a significant increased effect on larval mortality and further decreased coral larvae survival time. Graham *et al.* (2017: 97) further state that the result of their study evidently shows ‘‘the sensitivity of coral larvae to temperature and have implications for dispersal potential because fewer larvae will survive to disperse. Such projected declines in connectivity among coral populations are likely to undermine reef resilience’’. Thus, the scientific discourse shows that the lack of abundance of coral larvae due to increased sea-surface temperature brought on by the effects of climate change, at least for some types of coral, will ultimately result in the Reef’s decreased connectivity, and thus overall resilience. Outside of coral larvae supplies, the scientific discourse further depicts the theme of lack of abundance as a result of climate change regarding coral reef fish densities. In fact, a particular

study by Triki and Bshary (2019) has examined whether recent climate-change related disturbances (cyclones, storms and prolonged heatwaves) had an impact on the coral reef fish communities at Lizard Island, northern GBR. By examining fish survey data collected pre and post disturbance, Triki and Bshary (2019) showed that there was a 68% decline in fish density post-disturbance and that nine out of 11 trophic groups experienced a significant decrease in density. Importantly, these nine trophic groups include browsers, corallivores, detritivores, excavators/scrapers, grazers, macro-invertivores, pisci-invertivores, planktivores and spongivores whereas piscivores were the only trophic group that experienced an increase post-disturbance (Triki and Bshary, 2019). As such, Triki and Bshary's (2019) study ''provide[s] evidence that the fish assemblage on the reefs around Lizard Island was considerably affected by extreme weather events, leading to changes in the functional composition of the reef fish assemblage'' where the latter changes within functional groups may result in important impacts on the food web trophodynamics within the GBR. Similarly, a study undertaken by Fontoura *et al.* (2020) which investigated how shifts in the morphological structure of coral assemblages showed that changes in coral convexity, ''a continuous morphological trait that captures volume compactness and the amount of space within a colony, capturing a continuous gradient from branching to massive colony shapes as convexity increases'' (Fontoura *et al.,* 2020: 559), alone explained more than 20% of juvenile reef fish declines (Fontoura *et al.,* 2020). Overall, a significant decline of 39% of juvenile fish density was observed between 2015 (pre-bleaching) and 2017 (post bleaching) (Fontoura *et al.,* 2020). Importantly, successive coral bleaching events have shifted the morphological structure of coral assemblages on the GBR (Fontoura *et al.,* 2020: 557). As such, climate change, through shifting morphological structure of coral assemblages, has resulted in a lack of abundance of juvenile reef fishes on the GBR as the latter did not hold sufficient safer areas, provided by more complex coral structures. Fontoura *et al.* (2020: 557) further state that ''continued large-scale shifts in the relative abundance of

morphological groups within coral assemblages are likely to affect population replenishment and dynamics of future reef fish communities''. However, compared to 2015 (pre-bleaching), adult reef fish displayed a 76% increase in density in 2017 (post-bleaching), thus highlighting the idea of varying ecological responses to the effects of climate change.

6.4 Climate change and the GBR: fragmented by geographic and taxonomic variability

While the scientific discourse paints a picture of a GBR whose ecological state, integrity, and resilience are on an overall negative trend, a significant portion of the discourse communicates the variability of the Reef's ecological responses to the effects of climate change. The latter idea is perfectly worded in Vercelloni *et al.*'s (2017: 1337) study in which 16 years of broad-scale surveys on the GBR were used to estimate coral cover trajectories in the face of climate change, which states ''[m]odel estimates revealed coral cover trajectories that were highly variable according to location but that fairly consistently declined at a regional spatial scale''. Indeed, various studies found within the scientific discourse highlight the variability of coral and reef ecological responses to climate change, and in particular, to bleaching events according to geographic location. To begin, a study undertaken to quantify the effects of bleaching events on the GBR by Harrison *et al.* (2019) has shown that while extensive and severe coral bleaching resulting in mass coral death occurred throughout the GBR in both 2016 and 2017, bleaching in 2016 was restricted to reefs in the central Queensland area where 81% to 95% of coral colonies were bleached, whereas bleaching in 2017

affected atolls further south but was less severe thus only affecting 20% to 72% of colonies. Importantly, the depth of the survey, the composition of the coral assemblages, nutrient levels, current flow, incident light, light attenuation and coral taxa were found to influence the effects of bleaching on coral (Harrison *et al.,* 2019). Similarly, a study conducted by Vercelloni *et al.* (2017) has provided evidence that coral cover trajectories following climate-related disturbances are highly spatially variable. In fact, 25% of GBR sites demonstrated increasing followed by decreasing trajectories, 13% of sites showed decreasing trajectories, seven percent displayed a decreasing and then increasing trajectories (specifically in the Cairns and Swain subregions), and one percent of sites (specifically in the northern-most mid-shelf and outer-shelf habitats in the Cooktown-Lizard Island and Cairns subregions) displayed increasing coral cover (Vercelloni *et al,* 2017: 1334-1344). Vercelloni *et al.* (2019: 1347) further showed that continuous declines in coral cover were only present in the central GBR (Townsville and Whitsundays) regions and that there exists ‘‘considerable spatial variability in the trajectories of acroporid coral cover at the site scale. For example, more than 50% of surveyed reefs in the subregions of Cairns, Townsville and Whitsundays exhibited different trajectory types among sites within reefs situated only a few hundred meters apart’’ (Vercelloni *et al.,* 2019: 1348). Moreover, reduced pH, which is associated with ocean acidification, has been shown to lead to stunted coral growth and increased bioerosion and dissolution of dead corals (Kline *et al.,* 2019). Importantly,

> any cause of living coral cover decline may make a reef more prone to experiencing faster rates of localized dissolution/bioerosion, whereas areas maintaining high living coral cover may be able to resist dissolution/bioerosion impacts from [ocean acidification] longer (…). [This] suggests there may be a relationship between [ocean acidification] vulnerability and bleaching vulnerability (Kline *et al.,* 2019: 1442)

thus further highlighting the variability of the Reef's ecological responses to climate change affected by total coral cover, differing at various locations.

Further, Hughes, Kerry and Simpson (2018) reported that given the lower summer temperatures in the southernmost region of the GBR, the latter was only subject to minor bleaching in 2016. Indeed, heat stress resulting in coral bleaching was not distributed evenly across the GBR where the latter was most concentrated and devastating in the northern areas of the Reef in 2016, while heat stress and coral bleaching were heavily concentrated in more southern regions in 2017 (Eakin *et al.,* 2019: 540). In fact, the sensitivity of individual reefs across the GBR to heat stress varies geographically where reefs in the southern GBR area may experience more single bleaching events at lower temperature increases than individual reefs in the northern or central areas of the GBR (Ainsworth *et al.,* 2016: 340). Furthermore, the scientific discourse has shown that a third of individual reefs within the GBR ''constitute warm spots that have consistently experienced bleaching stress. Moreover, 13% of the GBR are potential refugia that avoid significant warming more than expected by chance, with a modest proportion (14%) within highly protected areas. (…) [T]he existence of thermal refugia, potentially capable of delivering larvae to 58% of the GBR, may provide pockets of systemic resilience in the near-term'' (Cheung *et al.,* 2021). Similarly, a study by Ainsworth *et al.* (2016) has revealed that exposure to sub-lethal pre-stress climatic events is highly variable among reefs, with some individual reefs having a level of protection from or preparedness for the conditions that cause coral bleaching, whereas other reefs experience several climatic stress exposures in one single event thus revealing that past thermal stress events that subject corals to

protective sub-bleaching stress before reaching temperatures that cause bleaching may only be apparent on certain individual reefs within the GBR region. As such, coral ecological responses to climate change events are also variable according to whether corals have been subject to sub-bleaching and thermal stresses prior to exposure to temperatures that cause bleaching (Ainsworth *et al.,* 2016). While much of the scientific discourse's focus lies on the impacts of climate change on coral, Eakin *et al.* (2019: 539) confirm that ''the intensity and impacts of heat stress and coral bleaching vary on both a global and a local scale further causing impacts that extend far beyond coral, where fish and invertebrate communities are subject to significant changes''.

While geographic location leads to varying results in coral and community ecological responses to the effects of climate change, the scientific discourse provides evidence showing that ''community change on a single reef is highly variable and that while some areas of the reef are in decline, others are recovering'' (Tanner, 2017). In fact, whether an individual reef is protected or exposed has shown to be an important factor affecting the resilience of coral communities to the effects of climate change. In this sense, different types of coral habitats may display varying degrees of susceptibility to climate change. Indeed, Tanner (2017) has provided evidence that exposed reef crest habitats have shown more resilience to disturbance than have protected reef crest habitats. Thus, ''reef-crest coral assemblages are highly variable at small spatial scales, with about 40% of variation in adult abundance over the entire Great Barrier Reef occurring at the scale of metres'' (Hughes *et al.,* 1999 in Tanner, 2017: 1229). As such, variability not only depends on geographic location but also on the habitat type.

Moreover, much of the variability in response to climate change within one single location can be attributed to the differing coral species and taxa at any given location. Indeed, it has been shown that *Acropora* corals continue to be one of the most severely impacted coral taxa during heat stress (Hughes et al. 2017). In a study conducted by Harrison *et al.* (2019: 716), bleaching was lower at higher depths, at high nutrient sites, and at sites dominated by *Porites* as opposed to sites where there was an abundance of *Stylophora*, *Pocillopora* and *Acropora.* Furthermore, Álvarez-Noriega *et al.* (2018) have shown that juvenile corals from the *Acropora* and *Goniastrea* species were less susceptible to bleaching than their adult counterparts but that adult corals from the *Pocillopora* species and taxa within the family *Merulinidae* were less susceptible to bleaching than their juvenile counterparts. As such, different coral species and taxa can show varying susceptibilities to bleaching at different life stages, regardless of geographic location. In a similar fashion, morphological coral community composition has been shown to shift after climatic disturbances where the abundance of encrusting corals was reduced in comparison to pre-disturbances (Sato *et al.*, 2018: 431). However, despite the latter, encrusting corals have a faster recovery rate following climatic disturbances, such as cyclones, in comparison to branching species (Fine *et al.*, 2019: 5). Indeed, branching and massive coral species are more susceptible to cyclones, marine heatwaves, repetitive floods, and bleaching events than are soft and encrusting coral species (Fine *et al.*, 2019: 5). As such, the scientific discourse has provided evidence that soft corals, such as those from the genera *Sarcophyton*, *Lobophytum* and *Sinularia*, become dominant following climatic disturbances oftentimes resulting in a major decline in coral species richness (Fine *et al.*, 2019: 5). The change in coral communities following climatic events further demonstrates the fact that different coral species and taxa display various levels of ecological resilience to climate change.

6.5 The scientific discourse's overall image of the GBR

The scientific discourse provides a discursive ecosystem which paints an overarching negative trend regarding the GBR's ecological resilience, integrity and thus overall health. In fact, ''even under aggressive action [to reduce greenhouse gas emissions, and thus to reduce the impacts of climate change], coral cover on reefs exposed to the single and repetitive bleaching trajectories will fall below 5%'' (Ainsworth *et al.,* 2016: 340). Similarly, Wolff *et al.* (2017: 1986) state that their ''results are consistent with global analyses predicting that the frequency, areal extent and severity of bleaching events will increase'' thus further providing evidence that the GBR's resilience will continue to be challenged via the effects of climate change. The occurrence and context of the use of words with negative connotations as opposed to those with positive connotations further highlights the idea that the scientific discourse utilizes textual components to draw an image of the GBR which depicts its overall ecological decline. In fact, the word *decline* was used 739 times throughout the scientific discourse, where its incorporation was used to depict the GBR's ecological status as highlighted through the following statement: ''[t]emperature stress (31°C) significantly impacted survivorship (90-95% decline) [of *Acropora muricata* and *Acropora hyacinthus* coral], and over the long-term, there was a 50-90% decline in calcification across both coral species'' (Anderson *et al.,* 2019: 1225). Similarly, the word *mortality* was used 1655 times within the scientific discourse in the following context ''[t]he effects of coral bleaching are numerous, ranging from short-term physiological damage to widespread mortality'' (Harrison *et al.*, 2019: 714). Moreover, the word *loss* was utilized 1010 times where its use in the scientific

discourse involves the discussion of ecological losses as seen through a communication by Cheung *et al.* (2021) which states that ‘‘[b]y 2020, 75% of bleached reefs were estimated to have suffered a major (80-100%) loss of larval supply and less than 1% experienced a minor (0-20%) loss’’. Next, *severe* was utilized 518 times to depict the effects of climate change on the GBR as seen through Hughes *et al.*’s (2019: 387) research which states that the ‘‘1,400-km expanse of the Great Barrier Reef, comprising the northern two-thirds of the world’s largest reef system, was severely damaged during back-to-back bleaching events’’.

In retrospect, words with typically positive connotations were used at a much lower frequency within the scientific discourse. Indeed, the word *pristine* was utilized 31 times throughout the scientific discourse. Importantly, pristine was not used within the scientific discourse to describe the current state of the GBR but rather to describe studies’ methodologies or the GBR’s past state as seen through Wolff *et al.*’s (2018: 1983) communication stating that ‘‘[t]his metric represents the ratio of mean coral cover (2017 – 2050) from model runs that include anthropogenic stressors (global warming, COTS, nutrient run-off) to mean coral cover under model runs that represent natural, pristine conditions’’. The same idea applies to the word *beauty*, utilized 91 times throughout the scientific discourse, which includes communications such as ‘‘[f]or example, 90% of local residents in the region felt that the GBR had outstanding beauty’’ (Marshall *et al.*, 2019: 581). Finally, while the word *colour* was used 362 times, most of its use was dedicated to an article discussing colour vision of reef fish (n= 230) and to an article which utilized colour index cards to determine levels of bleaching on the GBR (n= 36). However, the remainder (n= 96) were used to describe the *lack* of colour or increased levels of bleaching on the Reef as communicated by Fang

et al. (2018: 33) where ‘‘[s]ponge bleaching was confirmed by the loss of colour and by chlorophyll fluorescence’’ (Fang *et al.,* 2018: 33). As such, words with negative connotation are present at a much higher frequency within the scientific discourse in comparison to words with positive connotations. Importantly, words with typically positive connotations were either utilized to describe the GBR’s past ecological state or were used in a negative context.

However, there are pockets within this discursive ecosystem which exist outside of the realm of this overall negative trend as communicated that

> [w]hile a number of recent studies have shown wide-spread decline in coral cover on the Great Barrier Reef due to a combination of natural and anthropogenic disturbances acting at different spatial scales (…), these studies also show that the decline is not consistent spatially or temporally and that some reefs do not follow the general trend, although the detail of what is occurring on individual reefs is necessarily obscured in these broader-scale analyses (Tanner, 2017: 1232).

As shown in section 6.1.3, different factors affect the GBR’s resilience, integrity and overall health status. Indeed, the effects of climate change have been shown to influence the latter in various ways according to geographic location (see Harrison *et al.,* 2019; Vercelloni *et al.,* 2017; Eakin *et al.,* 2019; Ainsworth *et al.,* 2016; Tanner, 2017), prior climatic events (see Ainsworth *et al.,* 2016; Sato *et al.,* 2018; Fine *et al.,* 2019), habitat type (see Hughes *et al.,* 2019), reduced pH (see Kline *et al.,* 2019) and coral species & taxa (see Hughes *et al.,* 2017; Harrison *et al.,* 2019; Álvarez-Noriega, 2018; Fine *et al.,* 2019).). Thus,

> [t]he high degree of variability in the trajectories of coral cover (…) is a function of geographical differences in disturbance probability (…) and sheer size (and number of reefs) on the GBR. (…) Contributing to the high variability in GBR-wide reef trajectories (…) are some important spatial patterns driven by geographical difference in global warming, cyclones, water quality and [Crown of thorns starfish] (Wolff *et al.* 2017: 1985-1986).

As such, the scientific discourse provides ample evidence highlighting the extensive variability regarding the GBR's responses to the effects of climate change. The scientific discourse therefore paints an image of the GBR where it's overall ecological health is on a negative trend, but also one that depicts the GBR as a fragmented ecosystem which displays multiple variable vulnerabilities to climate change.

CHAPTER 7
DISCUSSION

7.1 The discourses and their images of the Great Barrier Reef

As presented in the last three chapters, the managerial discourse, the tourism discourse and the scientific discourse each create their own images and representations of the Great Barrier Reef (GBR) as it continues to be affected by anthropogenic global climate change. Interestingly, however, each of the discourses seem to utilize, at least to some extent, a geographic scale and approach to produce these images and representations. Indeed, in utilizing scientific data published in peer reviewed articles, the scientific discourse utilizes a geographic approach to demonstrate that there exists significant variability in the Reef's ecological health and integrity not only at different geographic locations, but also within individual reefs and locations. As such, the scientific discourse paints the GBR as an ecosystem whose ecological responses, overall ecological health, and integrity to the effects of climate change differ according to geographic location where certain areas on the GBR have experienced a significant decline in health while others are either recovering or less affected. However, the scientific discourse further depicts the Reef as an ecosystem whose integrity, resilience and ecological health due to anthropogenic climate change are undoubtedly declining on a whole-of-Region level. Next, by utilizing data and evidence provided by the scientific discourse, the managerial discourse paints a similar image of the GBR than does the scientific discourse. Nevertheless, despite painting the image of a Reef whose health status is highly variable according to geographic location and specific ecological/biological/physiological factors, the managerial discourse utilizes the existence of variability, and thus of recovering or less

damaged individual reefs, to enable tourism. Moreover, the managerial discourse further enables tourism through the implementation of Citizen Science programs. In this sense, the managerial discourse not only paints a Reef whose ecological health is highly variable, but also a Reef that is well suited for continued tourism. Much like the management discourse, the tourism discourse paints the GBR as an ecosystem that is affected, with a certain degree of variability (especially in terms of geographic location), by anthropogenic climate change but that is ultimately overall aesthetically beautiful and able to recover with the assistance of tourism. Thus, in creating this representation of the GBR, the tourism discourse can in turn ironically paint tourism as the Reef's saviour from climate change. Importantly, the tourism discourse utilizes climate change to create several sellable tourism products. Tourism therefore utilizes the neoliberal commodification of nature to ultimately sell climate change in the form of tourism products.

7.2 Disaster tourism: neoliberalism and the commodification of nature

It is important to note that the terms capitalism and neoliberalism are not interchangeable. Rather, neoliberalism is a form of capitalism. In fact, Luciano (2018: 18) states that "[n]eoliberalism became late capitalism's ideological justification just as liberalism was the intellectual foundation for capitalism". David Harvey defines neoliberalism as ''the cutting edge of accumulation by dispossession [where] the state, with its monopoly of violence and definitions of legality, plays a crucial role in both backing and promoting these processes'' (Harvey, 2003: 157). Thus, while

capitalism is embedded with market exchanges, neoliberalism specifies these market exchanges, notably through privatization and the state's role as described by Harvey above. Therefore, ''neoliberalism can be briefly defined as a specific form of capitalism which is privatisation, marketisation, deregulation and various forms of re-regulation'' (Duffy and Moore, 2010).

Tourism of natural environments such as that of the GBR involves the marketisation of nature and its resources. Tourism can thus be inscribed in neoliberal capitalism as its practice involves the commodification of nature through its direct consumption by tourists. Neoliberalism is therefore but an acceleration of the creation of markets and commodification which can include the economic value of nature and *in situ* resource values. Indeed, while some research has shown that the commodification of natural resources through tourism practices, often promoted as a means to increase ecological conservation of said resources, has the ability to benefit both local communities and their environment (see Novelli *et al.,* 2006), an increasing popular belief and its associated research suggest that neoliberal conservation strategies used in tourism can result in increased ecological degradation (Fletcher and Neves, 2012). Thus, while neoliberal conservation strategies used in tourism are designed to incentivize ecological conservation by demonstrating the value of *in situ* natural resources (Fletcher, 2012) they often end up primarily focusing on economic growth (see González *et al.,* 2008). As such, neoliberal conservation is an extension of capitalism embedded in neoliberal policy. Moreover, discourses pertaining to an environment's ecological and biodiversity degradation by the tourism industry and its associated stakeholders may create niche situations of disaster capitalism practices through arguing that its associated tourism will

contribute to the destination's ecological conservation and preservation (See Arellano, 2011; Fletcher, 2012; Fletcher, 2019; Luciano, 2018).

Disaster capitalism, a term coined by Naomi Klein (2007: 6) defined as ''orchestrated raids on the public sphere in the wake of catastrophic events, combined with the treatment of disasters as exciting marketing opportunities'' further embodies a specific form of capitalism which not only seeks to harness crises created by capitalistic processes such as anthropogenic climate change, but rather seeks to harness these crises as opportunities for *further* accumulation (Fletcher, 2019: 526). Indeed, as states Fletcher (2019: 526), ''[a]s this definition implies, Klein sees this dynamic as particularly characteristic of capitalism's current neoliberal phase, wherein in addition to being harnessed as sources of new accumulation, disasters are also often used to justify further neoliberalization (i.e. privatization, marketization, commodification (…)) in a vicious cycle of escalating crisis. Importantly, disaster capitalism can be viewed as a neoliberal capitalism strategy where disasters, such as the accelerated degradation of ecosystems by anthropogenic climate change, are not only harnessed as sources of new accumulation but are then used to justify further neoliberalization to promote increased accumulation (Fletcher, 2019: 526).

In turn, while last chance tourism undoubtedly consists of harnessing a potential end of nature and transforming it into a tourism product (Fletcher, 2019: 522), it is evidently a form of disaster capitalism. Indeed, while Fletcher (2019: 523) suggests that a form of disaster capitalism, last chance tourism, involves the neoliberal commodification of not only nature, but the end of nature

itself where it ‘‘can be understood as a significant form of ‘‘disaster capitalism’’ seeking to transform the ostensive threat posed by Anthropocenic changes [such as anthropogenic climate change] to the future of (eco)tourism into new opportunities for further tourism expansion’’, it can be argued that all types of disaster capitalism harness the commodification of nature and the end of nature itself. Furthermore, Fletcher (2019) suggests that there exist many forms of disaster capitalism within the tourism industry. Indeed, disaster capitalism within tourism encompasses last chance tourism and voluntourism which occurs when a tourist pays for a tour through which they contribute free labour to a social or environmental cause where ‘‘in some projects, voluntourists’ labor is actually put to productive use, in many it is actually their money that is most desired as a key source of funding, in return for which they are made to feel useful by offered tasks that at least do not damage the work in question (Brightsmith, Stronza, and Hollee, 2008)’’ (Fletcher, 2019: 529). Further, Fletcher (2019: 529) suggests that scientific tourism which ‘‘involves travel to participate as a fee-paying, non-expert assistant in scientific research’’ is another component of disaster capitalism.

As part of disaster capitalism, tourism companies and destination marketing organizations (DMOs) utilize climate change as a marketing tool to sell tourism products (Fletcher, 2019: 528). Moreover, ‘‘[t]he global tourism industry can be seen as one of the world’s most effective and creative forms of disaster capitalism, by means of which a variety of problems precipitated by capitalist development are transformed into new ‘‘products’’ for tourist marketing and consumption’’ (Fletcher, 2019: 528). Therefore, ecotourism and nature-based tourism products, such as those found on the GBR, are quite literally sold because of the ways in which anthropogenic climate

change affects the ecosystem and environment. Thus, it can be said that disaster capitalism, and therefore by association a term I'd like to coin as ***disaster capita-tourism***, products are sold through neoliberal practices on the mere basis that disasters, such as climate change, continue to occur. Indeed, without climate change or other types of disasters and environmental degradation, disaster tourism products would not exist. Fletcher (2019: 525) perfectly articulates this thought through stating ''[i]n this way, the ostensive threat posed by the Anthropocene to the [tourism] industry's future may be paradoxically transformed into an opportunity for further expansion''. Ironically, however, certain forms of disaster tourism (such as last chance tourism) practices are considered as one of the main forms of both financial and institutional support for the protection of natural environments and the various species, including endangered ones, which they house (Fletcher, 2019: 525). Furthermore, forms of disaster tourism (notably last chance tourism, volunteer tourism, and science tourism) are usually promoted by a conservationist discourse which denounces to tourists that their visitation of these destinations will have a lasting impact leading to positive changes (Fletcher, 2019: 527). In addition, this conservationist discourse suggests that the practice of certain forms of disaster tourism will raise awareness of the impacts of anthropogenic climate change on ecosystems, the environment and other forms of life (Fletcher, 2019: 528).

7.2 Combatting last chance tourism with commodification through science tourism

To better understand how the GBR's tourism discourse attempts to combat the promotion of last chance tourism through science tourism, an overview of the ways in which this discourse

commodifies and further employs neoliberal strategies to market climate change is needed. As shown in Chapter 5, the tourism discourse ultimately transforms climate change on the GBR into various tourism products. The latter take on many forms such as having exclusive visiting rights to certain locations, visiting research stations where research is undertaken to aid in the Reef's recovery from the effects of anthropogenic climate change, attending educational talks/lectures provided by marine biologists, and participating in Citizen Science initiatives such as the Eye on the Reef program which entails tourists reporting on how climate change, amongst other threats, has affected the ecosystem. All these tourism products require harnessing and further commodifying climate change on the GBR. As suggests Fletcher (2019: 528), ''[i]n extinction tourism [, also known as last chance tourism,] value is thus actually created by nature's ostensible diminution''. In combining the fact that the scientific discourse provides evidence that the Reef is on an overall ecological decline with the fact that anthropogenic climate change is the ecosystem's biggest threat (GBRMPA, 2019), commodifying climate change, at first glance, seems to promote the existence of last chance tourism through the GBR's tourism discourse as in this sense, tourism value on the GBR is created by the very existence of climate change, and thus by the ecosystem's ecological diminution. However, while the GBR's tourism discourse undoubtedly commodifies nature, and specifically commodifies climate change on the GBR where the latter is transformed into a plethora of tourism products, the discourse in question attempts to not only stay away from the promotion of last chance tourism, but also attempts to combat the very idea of last chance tourism on the GBR.

The latter is further supported in a study published by Goldberg *et al.* (2018) which shows that while tourism operators on the GBR believe that climate change is an immediate threat, most are hesitant to engage tourists about climate change regardless of acknowledging an interest, expertise, and responsibility to do so. In fact, while most tourism operators highlighted sustainable use and conservation of the marine environment as paramount to their work, they also felt that engaging and educating tourists about the threats to the GBR was important (Goldberg *et al.,* 2018: 244). Nonetheless, most tourism operators did not discuss climate change with their guests (Goldberg *et al.,* 2018: 246). The latter can be attributed to the fact that the tourism operators'

> ''main concerns were to ensure a good visitor experience, provide a safe environment for guests and staff, manage the profitability and administrative matters related to business operations, and hire and train good staff (…) [and that] some [tourism operators] were cautious about discussing negative topics with guests as they were concerned how these discussions would affect the tourism experience on the day. [Tourism operators] also feared that guests would misinterpret information and spread bad publicity about the GBR back home, negatively influencing the tourism industry by reducing visitor numbers and business revenue'' (Goldberg *et al.,* 2018: 249).

As such, the tourism discourse employs distinct strategies to combat the idea of last chance tourism given that the latter entails the acknowledgement of the Reef's demise and thus of the GBR tourism's demise by association. These strategies not only combat the idea of last chance tourism on the GBR, but further promote its tourism through neoliberal commodification. The tourism discourse therefore ultimately employs strategies to ensure the perennity of tourism on the GBR.

Indeed, all while acknowledging the existence of climate change on the GBR, the tourism discourse paints an *overall* ecologically healthy image of the ecosystem. As states Goss (1993: 665), ‘‘[t]he first task of the advertiser is to attract the attention of the targeted readers and address them as prospective visitors’’. The tourism discourse therefore ultimately utilizes idyllic nature as strategy to enable tourism through neoliberal commodity. Indeed,

> ‘‘[a]s Büscher argues, neoliberalism has produced ‘derivative nature’ because the value of nature is brought into the arena of commodities and priced in monetary terms; for Büscher, derivatives are financial mechanisms whose monetary value is derived from value of the underlying assets. We can extend this to help us understand nature-based tourism: ‘nature’ constitutes underlying asset, while the real source of value is images and symbols in the realms of branding, public relations, and marketing; the investment of capital is focused on ‘creating value out of meanings and images that nature (…) represent, rather than what they are’’ Büscher, 2010: 271 in Duffy, 2015: 533).

As such, the GBR tourism discourse utilizes generally idyllic text and images to paint an idyllic picture of the GBR, which is then commodified and used to attract potential tourists, thus ultimately promoting tourism on the GBR all while simultaneously combatting the notion of last chance tourism, and by association, combatting the idea of the eventual (and arguably fast approaching) ecological destruction or significant ecological transformation of the GBR. In doing so, the tourism discourse is able to rebrand the GBR as a tourism destination that is idyllic in specific locations all while acknowledging climate change in others.

Moreover, the tourism discourse's acknowledgement of the existence of climate change on the Reef is ironically used as a strategy to combat last chance tourism and the very idea that the Reef, on a whole-of-Region scale, is succumbing to the effects of climate change, despite the scientific discourse communicating the opposite. By acknowledging the existence of climate change on the GBR, the tourism discourse can then commodify it by creating climate-change driven tourism products such as Citizen Science programs and initiatives. Indeed, through the acknowledgment of climate change in certain areas of the GBR, the tourism discourse can ultimately promote science tourism, a close cousin to voluntourism & last chance tourism and further form of disaster tourism. Indeed, Fletcher (2019: 529) states that science tourism overlaps with voluntourism and that the latter

> ''can work to mitigate the impacts caused by their own implication in the travel industry – in the process providing a key source of value for the organizations they support to keep selling an experience of helping to *stave off* the end of nature. (…) Travel to participate in research concerning climate change and other Anthropogenic processes, such as documenting endangered species and threats posed to them, is a rapidly growing phenomenon, and hence a key means by which the end of nature is being incorporated into the Anthropocenic tourism industry'' (Fletcher, 2019: 529).

As such, both last chance tourism and science tourism are deeply embedded in disaster tourism, and thus, in neoliberalization. In utilizing the science tourism approach, however, the tourism discourse can ultimately adopt a geographic approach suggesting that certain areas of the GBR need saving, whereas others remain idyllic, all while painting tourism as the saviour. Ultimately, both tactics involve the commodification of climate change where the use of science tourism

communicates the perennity of the GBR and thus ultimately the perennity of GBR tourism. However, neither Fletcher, and to the author's knowledge, any other literature has shown the ways in which tourism utilizes the scientific discourse to not only combat the idea of last chance tourism, but to also promote tourism through neoliberal commodification by interpreting and applying the provided scientific findings based on their own needs and motivations: accumulation of capital. In turn, again to the author's knowledge, much like that of the tourism discourse, very little to no research has shown the ways in which the managerial discourse utilizes the scientific discourse to enable and further ensure the perennity of tourism at a destination severely affected by anthropogenic climate change through neoliberal commodification. Understanding how the scientific and managerial discourses are intertwined ultimately provides a better understanding of how the managerial and scientific discourses interact with the tourism discourse to further enable climate change commodification, and thus tourism. As such, the following section will discuss how the managerial discourse enables climate change commodification through tourism.

7.3 Setting up the climate change kiosk: management as a symbiont

As depicted in Chapter 4, the managerial discourse is one that is heavily reliant on the scientific discourse. In fact, the managerial discourse utilizes the scientific discourse to guide the management of the Great Barrier Reef Marine Park through the implementation of regulations, management plans, permits, licenses, compliance actions and zoning plans (GBRMPA, 2019: 197). On the GBR, tourism is managed through a permit and zoning system which allows certain

activities to be undertaken in specifically zoned areas (Coghlan and Prideaux, 2007: 294). Thus, the Zoning Plan is based on a geographic approach, as provided through the scientific discourse which suggests that certain areas on the GBR are more affected or susceptible to the effects of climate change and other anthropogenic stressors while other regions require less protection. In this sense, the managerial discourse directly utilizes the scientific discourse to manage and ultimately enable tourism on the GBR. Indeed, while commercial marine tourism always requires permission, it can be conducted in almost every zone of the Marine Park and various additional restricted areas (except Preservation Zones) (GBRMPA, 2019: 112). Importantly, Preservation Zones make up less than two percent of the GBR Marine Park (GBRMPA, 2019: 131). As such, tourism is permitted in 98% of the GBR even though many of its individual Reefs, as also indicated by the scientific discourse, are losing resilience & integrity and are on an ecological decline. Thus, while the GBRMPA Zoning Plan is based on the scientific discourse and is meant to help manage the preservation and integrity of the GBR, it is ultimately one that does not impose many restrictions on tourism.

In fact, in high-use tourism areas within the Marine Park, statutory plans of management accompany the Zoning Plan rules are used which, amongst other things, caps the number of tourism operations and defines maximum group and tourism vessel sizes at specific locations (GBRMPA, 2019: 112). As a result, only a certain number of tourism operators have access to certain sites, which therefore means that by association, only a certain number of tourists have access to certain locations. In doing so, the managerial discourse, through its Zoning Plan, which is fundamentally based on a geographic approach, therefore utilizes the scientific discourse through its own

geographic approach in order to ultimately create a sense of rarity and exclusivity regarding tourism on the GBR. In turn, this rarity and exclusivity results in the enhanced promotion of GBR tourism. The tourism industry's use of this managerial-created rarity and exclusivity to promote tourism will be discussed in greater detail in the next section but it is important to note that rarity and exclusivity exist due to the managerial discourse's application of the scientific discourse.

Moreover, the managerial discourse further enables GBR tourism through the creation of Citizen Science initiatives such as the Eye on the Reef monitoring and assessment program which enables individuals who visit the GBR to collect information about its health, marine animals and incidents, thus seemingly contributing to its long-term protection. With the management-driven message stating that tourists can contribute to the GBR's long-term protection through participating in Citizen Science programs, tourists are positioned as saviours, thus further enticing their participation. In turn, the latter undoubtedly promotes tourism through the commodification of climate change on the GBR. In addition, however, preserving the ecosystem through the proper use of scientific evidence is also in management's best interest, especially given that ''a decline in reef health can be expected to translate into a decline in visitor numbers and serious impacts on regional economies'' (Coghlan and Prideaux, 2007: 294). Importantly, the data obtained by tourists participating in Citizen Science programs has been shown to be similar in terms of accuracy and reliability to that provided by professional researchers and scientists (Butler *et al.*, 2023: 5). Furthermore, Citizen Science can enhance data collection across impressive spatial and temporal scales, which would be next to impossible through any other means (Cerrano *et al.*, 2017 in Butler *et al.*, 2023: 6). Thus, the implementation of Citizen Science programs involves the

commodification of climate change but can also positively contribute to the data needed to undertake complex ecological management initiatives.

However, enabling tourism through the commodification of climate change on the GBR has significant economic impacts for the GBRMPA. In fact, while management's direct advantages of enabling tourism may not be evident at first glance, it is crucial to note that as part of their permits, tourism operators must collect an Environmental Management Charge (EMC) from all GBR Marine Park visitors which was set as $5.00 AUD in 2007 (Coghlan and Prideaux, 2007: 296). Importantly, the revenue from the EMC is used to fund Marine Park management plans which include education, ranger patrols, policy development and supporting research into tourism on the GBR (Coghlan and Prideaux, 2007: 294). As such, through the utilization of the scientific discourse's geographic approach to commodify climate change through enabling tourism, the managerial discourse can ultimately secure capital all while displaying a conservationist message which communicates that tourists can contribute to the Reef's long-term sustainability by visiting it. Thus, enabling tourism is clearly in the GBRMPA's best interest. In this sense, the managerial discourse can be viewed as a symbiont to the tourism discourse.

7.4 Enabled: tourism's own interpretation and application of science

While the GBR tourism discourse undoubtedly commodifies climate change through neoliberal practices which ultimately promote further tourism within the GBR Marine Park, it is important to note that tourism utilizes both the scientific and managerial discourses to do so. Indeed, by utilizing the geographic approach provided by the scientific discourse and further implemented by the managerial discourse and its practices, tourism is given the space to exist and thrive on the GBR. Importantly, however, the tourism discourse ultimately forms its own interpretation and application of the scientific and managerial discourses through specific use of geographic scale.

This notion can first be supported by the ways in which the tourism discourse utilizes management's guidelines to set vessel and passenger caps at certain locations within the GBR. While management utilizes the scientific discourse to set caps at certain locations therefore meaning that only a small number of tourism operators and a small number of tourists can access certain areas on the GBR, the tourism discourse utilizes the latter to promote rarity and exclusivity in GBR tourism. By promoting this exclusivity, tourists are sold a sense of rarity, thus ultimately driving enhanced tourism on the GBR. It is crucial to note that this sense of exclusivity and rarity would not exist without management-imposed geographic restrictions, which in turn would not exist without the scientific discourse stating that certain areas need to be protected. Thus, it can be stated that exclusivity and rarity within the GBR tourism industry would not exist without the presence of climate change. In this sense, the tourism discourse therefore commodifies climate change to create exclusive tourism products. In addition, by utilizing the geographic scale, tourism operators argue that given the fact that they have exclusive rights to visit areas of the GBR (or that very few operators have permits to access the location in question), the visitation of these areas is

on a very small scale. Thus, the tourism discourse ultimately suggests that having exclusive (or near exclusive) access to GBR areas will ensure its ecological longevity and protection. In doing so, the tourism discourse ultimately utilizes the geographic approach provided by the scientific & managerial discourses and applies it to a very small scale (individual reef-level that they have access to) that suites their needs and best interests: capital gains.

Furthermore, the tourism discourse's own interpretation and application of the scientific and managerial discourses' geographic approach can be seen in the promotion of Citizen Science on the GBR. Indeed, by utilizing the geographic approach where focus lies on a small scale such as that of an individual reef within the GBR, the tourism discourse can communicate to tourists that certain areas need enhanced protection and help in its ecological recovery. In communicating this message, the tourism discourse can promote tourism on a small geographic scale where tourists can not only directly see the Reef's ecological responses to climate change but can also measure their direct impacts as citizen scientists. In turn, the tourism discourse can ultimately sell the idea that tourists can save the Reef by promoting tourism in specific geographic areas within the GBR that are experiencing an ecological decline. Interestingly, while Citizen Science can be beneficial through providing accurate and plentiful scientific data where studies have shown the important role of Citizen Science in helping manage environmental issues and challenges in natural environments, this type of tourism allows tourists to become ''beneficiaries of significant improvements in coral reef ecology, conservation, and restoration knowledge [given that Citizen Science can] be a powerful vehicle in the education of tourists about environmental crises or issues, [which ultimately results] in enhancing tourist experiences'' (Butler *et al.*, 2023: 6). As such, by

promoting Citizen Science on small geographic scales such as on an individual reef-level, the tourism discourse can not only paint tourists as GBR saviours where conservation and preservation initiatives are measurable but can also ensure positive tourist experiences. Promoting tourists' participation in Citizen Science on the GBR can therefore be seen as a method employed by the tourism discourse to enhance tourist experiences as the latter comprises tourism's main goal (Fletcher, 2019: 529). As such, whilst Citizen Science on the GBR would not be necessary without the presence of ecological stressors such as those presented through anthropogenic climate change, it is clear that the promotion of Citizen Science, especially with the fact that the latter is attributed with enhanced visitor experiences, is a direct result of neoliberal mechanisms which commodify climate change. Moreover, as states Duffy (2015: 534) ''it can also be argued that the production of new sensory experiences [, as those involved in the participation of Citizen Science programs on the GBR,] also intensify, deepen, and extend neoliberalism by conjuring up a new commodity, *the experience*, that can be sold over and over again''.

Lastly, by interpreting and applying the scientific and managerial discourses to such a small geographic scale, the tourism discourse can ignore/hide the fact that the practice and participation in tourism itself significantly contributes to anthropogenic climate change (Lenzen *et al.,* 2018: 522), and therefore to the GBR's ecological decline, all while further commodifying climate change. In fact, tourism alone is responsible for the consumption and emission of 8% of greenhouse gas emissions (Lenzen *et al.,* 2018: 522) and the specific visitation of the GBR consists of participating in lengthy travelling for most tourists, thus evidently contributing to anthropogenic climate change (GBRMPA, 2019: 111). Applying the scientific and managerial discourses at a

small geographic scale ultimately allows the tourism discourse to direct messaging promoting *in situ* tourism through neoliberal commodification of climate change to seemingly improve the Reef's ecological status all while hiding the ways in which tourism itself significantly contributes to anthropogenic climate change and thus to the GBR's ecological decline. Importantly, a study on entrained dolphins who are encouraged to visit tourists via feeding and interaction strategies by Bulbeck (2004 in Duffy, 2015: 534) has shown that the problems associated with enabling and producing these types of interactions (which include poor health and shortened life spans for dolphins) are invisible to tourists. The latter is similar to this current study in which the problems associated with enabling the neoliberal commodification of climate change resulting in enhanced tourism, and by association increasing levels of greenhouse gas emissions and anthropogenic climate change, are hidden from tourists who instead are made to feel as though they are saving the GBR from the very stressor they are contributing to: anthropogenic climate change. As states Fletcher (2019: 528) ''[a] more perfect circle of disaster capitalism would be difficult to imagine'', and in turn, a more perfect circle of ***disaster capita-tourism*** would be difficult to imagine.

7.5 The scientific discourse's role in neoliberal commodification of climate change

While this chapter has already discussed, to some degree, the ways in which the scientific discourse contributes to the tourism discourse's neoliberal commodification of climate change on the GBR, a standalone section to highlight the latter is important given how powerful this interaction is in

ultimately enabling this type of commodification. In being based on peer-reviewed scientific literature, the scientific discourse provides an accurate representation of the GBR's ecological health status, integrity, and resilience, thus demonstrating that the ecosystem in question is highly ecologically variable to the effects of anthropogenic climate change according to geographic location, amongst other things. In simply providing this evidence, the scientific discourse, perhaps despite its best intentions, allows for the managerial and tourism discourses' own interpretations of the scientific findings. Thus, by merely showcasing the existence of variability on the GBR, the scientific discourse communicates that certain locations are in dire need of conservation efforts, while others require less ecological protection. This in turn allows for the managerial discourse to utilize this information to enable the existence of GBR tourism which ultimately allows tourism to commodify idyllic nature at sites that are less affected by climate change *and* commodify climate change through Citizen Science initiatives and other such tourism practices (visiting research stations, participating in marine biologist talks, etc.) at sites that are succumbing to the effects of climate change. ''Indeed, whilst scientists or researchers are primarily motivated to protect natural environments for ecological reasons, tourism industry stakeholders are predominantly concerned with the economic value that natural assets offer and the importance of providing high quality tourist experiences in natural environments'' (Butler, 2023: 7). However, unlike shown in any previous research, it is the very existence of the scientific discourse which allows for the perennity of tourism at natural tourism destinations severely affected by anthropogenic climate change. Thus, while Hollinshead and Suleman (2018: 204) argue that tourism's role is to act as an agent of fabrication of spaces as opposed to creating mirrored or accurate representations of such spaces, this study suggests that the tourism discourse actually utilizes the accurate representation of such spaces, provided by the scientific discourse, to promote tourism through neoliberal commodification, regardless of whether it is to promote more idyllic locations or those who are on

an ecological decline. This is possible due to the GBR's immense geographic scale and thus variability in ecological responses to anthropogenic climate change, as depicted in the scientific discourse.

7.6 The Red Queen Hypothesis: competition and interdependence between discourses

The Red Queen Hypothesis, a theory used in biology, was proposed by biologist Leigh Van Valen in 1973. To explain the phenomenon of evolution and adaptation between species in competition, Van Valen referred to a particular scene in Lewis Carroll's (1872) *Through the Looking Glass and What Alice Found There*, where Alice tries to catch The Red Queen by running as fast as possible, but cannot do so:

> '[w]ell, in our country,' said Alice, still panting a little, 'you'd generally get to somewhere else – if you run very fast for a long time, as we've been doing.' 'A slow sort of country!' said the Queen. 'Now, here, you see, it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!' (Carroll, 1872).

The Red Queen Hypothesis therefore suggests that species and their competitors adapt to their specific environments due to evolution and ''states that for an evolutionary system, continuous

development is needed just to maintain its relative fitness'' (Heylighen and Campbell, 1995 in Carmona, 1996: 15). Even though this theory has a biological sciences basis, it has been used in tourism studies to discuss the notion of conflict between humans, climate change and disappearing tourism destinations (Jenkins, 2017). Indeed, as states Jenkins (2017: 44),

> [t]he Red Queen Theory is in essence a competition between predator and prey and the ability of both to adapt to the others' evolving capacities. True, climate is not considered a living organism in the true sense of the word, but it is an agent of change, with qualities that affect the environment and the resources available for living species (Jenkins, 2017: 44).

The latter can be compared to the managerial, scientific and tourism discourses. In turn, the interactions within the discursive ecosystem created by the three discourses include those that are parasitic, predatory, and competitive, depending on the discourses in question.

First, the messages communicated by the scientific discourse and the tourism discourse are seemingly contradictory. While the scientific discourse provides evidence to show that the reduction of anthropogenic climate change is crucial to protect and ensure the perennity of the GBR, the tourism discourse not only sells climate change but in doing so also further contributes to the latter through tourism at the GBR itself. To do so, the tourism discourse utilizes a competitive approach in which the scientific discourse is used against itself to promote tourism and ultimately worsen the condition of the GBR despite its motivation to protect it. Ultimately, tourism uses

science to improve and enhance its own perennity through utilizing the scientific discourse's geographic approach to promote neoliberal commodification of climate change. However, to operate, tourism needs management.

Indeed, the relationship and interactions between the tourism discourse and the managerial discourse is a symbiotic one where the managerial discourse enables tourism on the GBR, driven by motivation to increase its own capital through tourism. With that being said, the managerial discourse also relies on the scientific discourse given that the protection, conservation and perennity of the GBR is crucial to ensure its continued tourism, and by association, its continued accumulation of capital by neoliberal market policies. Thus, the relationship between the managerial discourse and the other two discourses is doubly symbiotic, with an extension of management-driven parasitism on the scientific discourse side, where management directly utilizes the scientific discourse to enable tourism, despite its contradictory motivations and end goals for the environment in question.

However, while the scientific discourse is ultimately seemingly concerned with the long-term protection of the GBR, it is important to draw attention to the fact that the scientific discourse also benefits from tourism in that the data provided through tourism-run Citizen Science is used to fuel scientific research and thus, the scientific discourse. In this way, the scientific discourse utilizes tourism to advance itself, thus highlighting direct competition between the two discourses.

Thus, there exists an interdependence between the discourses in which the scientific discourse supplements an argument for the existence of both climate change and idyllic related tourism products on the GBR, the managerial discourse implements the scientific discourse in its management plans all while legitimizing tourism, and in turn, tourism supplements management via capital accumulation and supplements science via collected data. As such, the interaction between the three discourses creates a competitive entangled discursive environment in which enmeshment is of utmost prevalence. Each discourse ultimately utilises each other to ensure its own existence, growth, and perennity all while promoting neoliberal commodification.

CHAPTER 8
CONCLUSION

Anthropogenic climate change has and continues to bring important ecological transformations to natural environments which also serve as tourism destinations. While climate change is a topic that continues to be abundant within the current tourism literature, the latter heavily focuses on subjects such as the representation of climate change destinations in tourism promotional material, the commodification of nature through climate change, the promotion of last chance tourism and the effects of climate change on tourism practices. As such, to provide novel information on an extensively researched topic, this study utilized an interdisciplinary approach to analyze the ways in which different discourses create various representations of a natural tourism destination affected by the effects of anthropogenic climate change, which in turn interact within a complex discursive ecosystem to ultimately enable the perennity of tourism through neoliberal practices. It is through the heavy focus on the ways in which both the managerial and scientific discourses contribute to not only the existence but rather the expansion of tourism practices that render this study unique within its field, as this specific topic has not yet been explored within the literature up to this point.

The case study of the Great Barrier Reef was utilized as the latter continues to be an important Australian iconic tourism destination despite its decline in ecological health attributed, at least in large part, to the everlasting and increasing effects brought on by anthropogenic climate change. In addition to the Great Barrier Reef existing as a renowned tourism destination, therefore meaning

the ecosystem has an extensive tourism discourse, the Great Barrier Reef also has a strong managerial and scientific presence. Thus, the Great Barrier Reef, as both a tourism destination and ecological entity, exists within the discursive ecosystem provided through the tourism promotional discourse, the managerial discourse and the scientific discourse, making it the ideal case study for the research in question.

This study has shown that there exists complex and intertwined relationships between the tourism, managerial, and scientific discourses which make up a discursive ecosystem of competition, symbiosis and parasitism. In turn, each of the discourses creates its own specific representation(s) of the Great Barrier Reef. Further, while each of the three discourses enables the commodification of nature and the commodification of climate change through tourism, it is ultimately the interaction between the three discourses that allows for tourism's perennity on the Great Barrier Reef despite the fact that it continues to be ecologically affected, transformed, and on an overall ecological decline due to anthropogenic climate change. Ultimately, the scientific and managerial discourses allow the tourism discourse to utilize two main representations of the Great Barrier Reef to instill neoliberal strategies to further promote the perennity and expansion of tourism:

a) the Reef is affected by climate change, come save it! (commodification of climate change through science tourism products), and
b) come visit, it's beautiful! (nature commodification through strategic methods such as promoting exclusivity).

There exists various future studies on this topic that would be exceptionally interesting to conduct. In particular, when an iconic tourism destination such as the Great Barrier Reef undergoes further ecological transformations and destruction due to the effects of climate change, the latter undoubtedly garners extensive media-related attention. Undertaking a study which analyzes the interactions between the media discourse, the tourism discourse, the managerial discourse, and the scientific discourse to provide a deeper understanding of the ways in which these discourses employ neoliberal commodification strategies to promote tourism would provide a better holistic understanding of the broader discursive ecosystem in which the Great Barrier Reef exists. In turn, this holistic understanding of the Great Barrier Reef's discursive ecosystem may offer insight into forming adequate sustainability management initiatives and tourism best practices to ultimately steer away from those currently embedded in neoliberalism.

Moreover, it is suggested that the promotional discourse provided by tourism operators and the tourism industry as a whole, the managerial discourse provided by the environment's governing agencies, *and* the ecological scientific discourse provide *one* unified message and representation of tourism destinations in response to climatic impacts. In this event, messages communicated through the promotional discourse, through the managerial discourse, *and* through the ecological scientific discourse will be the same. In doing so, accurate and realistic portrayals of tourism destinations may ultimately reach target audiences and accurate sustainable and conservation practices may be better achieved. However, while most research papers tend to conclude with several implications and recommendations, which, in this case, would take the form of suggested modifications for each of the three discourses where true ecological conservation and sustainability,

freed from capitalistic and neoliberal mechanisms can be favoured, the author has chosen a different approach. The only dire recommendation is to untangle all aspects of ecological conservation from the capitalist system. As such, the lack of the typical recommendations approach is utilized as a strategic and calculated method meant to reinforce how the three discourses are so deeply intertwined and instrumentalized by capitalism. Without a liberation from the capitalist system, true ecological conservation is and will remain unattainable.

APPENDIX A
METHODOLOGICAL GUIDELINES

Research question:How do the ecological discourse, the promotional discourse and the managerial discourse contribute to the construction of images and representations of tourism destinations affected by global anthropogenic climate change?					
	Objectives	**Type of data**	**Actors**	**Data collection methods**	**Analysis methods**
Sub-question 1: **Analyse the promotional discourse, the ecological discourse and the managerial discourse in the production of destination images.**	Understand how the promotional, ecological and managerial discourses construct different images and representations of a tourism destination degraded by the effects of climate change.	Qualitative	Tourism operators, regional DMOs, scientific agencies (CSIRO, universities, AIMS), and the GBR governing body (GBRMPA).	Review of the scientific literature, promotional material and of articles/ literature published by the GBRMPA.	Content analysis.
Sub-question 2: **Compare the three discourses and their images of the GBR.**	Analyse how the discourses change with time in order to better understand their interactions in addition to the transmitted images throughout time as the effects of climate change accumulate.	Qualitative and quantitative	None.	Review of the scientific literature, promotional material and of articles/ literature published by the GBRMPA.	Content analysis.
Sub-question 3: **Examine how the three discourses interact to ultimately contribute to the commodification and neoliberalisation of nature.**	Show how each discourse competes with the other two in creating representations of the natural environment that serves the discourse's purpose. Analyse how each discourse may use the others as a competitive advantage in building representations of the destination.	Qualitative	None.	Review of the scientific literature.	Content analysis and discourse analysis

APPENDIX B

TOUR OPERATOR WEBSITES COMPRISING THE TOURISM DISCOURSE

Tourism Operator Name	Tourism Operator Website
1770 Creek 2 Reef Fishing Charters	https://www.1770creek2reef.com.au/
A1 Fishing Charters and Tours Whitsundays	https://aonefishingcharters.com/
ABC Snorkel Charters	https://www.abcsnorkelcharters.com.au/
Adrenalin Snorkel and Dive	https://adrenalindive.com.au/
Airlie Beach Day Sailing	https://www.airliebeachdaysailing.com.au/
Airlie Beach Fishing Charters	https://www.airliebeachfishingcharters.com.au/
Anchor Charters	https://www.anchorcharters.club/
Australian Sportfishing Charters	https://australiansportfishingcharters.com/
Aquascene Magnetic Island	https://www.aquascenemagneticisland.com.au/
Aquis Reef Charters	https://aquisreefcharters.com.au/
Aroona Luxury Boat Charters	https://aroonaluxuryboatcharters.com.au/
Aussie Barra Charters	https://aussiebarracharters.com.au/
Australiana Charters	https://www.auscharters.com.au/
Beach Fun Co	Website removed throughout the Covid19 pandemic
Bianca Charters	https://biancacharters.com.au/
Big Fish Down Under	https://www.bigfishdownunder.com/
Big Mama Sailing	https://www.bigmamasailing.com/
Billfish Sports Fishing	https://www.fishingcairns.com.au/billfish-sport-fishing/
Boab Boats	https://boabboats.com.au/
Bundaberg Region	https://www.bundabergregion.org/
Cairns Premier Reef & Island Tours	https://www.cairnspremierreefislandtours.com/
Cairns Reef Fishing Australia	https://cairnsreeffishing.com.au/
Calypso Reef Cruises	https://calypsoreefcruises.com/
Cape Tribulation – Port Douglas Daintree	https://www.visitportdouglasdaintree.com/cape-tribulation
Cape York Fishing Charters	https://capeyorksportsfishing.com/
Casual Fare Sailing Charters	https://www.casualfaresailing.com/
Coral Sea Dreaming Dive & Sail	https://www.coralseadreaming.com.au/
Coral Sea Foundation	https://coralseafoundation.net/
Coral Sea Kayaking	http://www.coralseakayaking.com/
Coral Sea Sportfishing Safaris	https://www.coralseasportfishing.com.au/
Cruise Whitsundays	https://www.cruisewhitsundays.com/
Curlew Escape	https://curlewescape.com.au/
Daintree River Fishing and Photography Tours	http://daintreefishing.com.au/
Daydream Island	https://www.daydreamisland.com/
Down Under Cruise and Dive	https://downundercruiseanddive.com.au/
Dragon Lady Port Douglas	https://dragonlady.com.au/
Eclipse FNQ Charters	https://eclipsefnq.com.au/
Elizabeth E II Luxury Liveaboard Charters	https://www.elizabetheii.com.au/
Elysian Retreat	https://www.elysianretreat.com.au/
Eureka Whitsundays Sailing Adventures	https://whitsundayssailingadventures.com.au/vessels/eureka
Hamilton Island	https://www.hamiltonisland.com.au/
Fairdinkum Fishing Charters	https://www.fairdinkumfishing.com.au/
Falla Reef Trips	https://www.fallareeftrips.com.au/
Fish City Charters	https://www.fishcity.com.au/
Fish Tales Charters	https://fishtales.com.au/
Fishin Mission	http://fishinmission.com.au/
Fitzroy Island	https://www.fitzroyisland.com/
Fitzroy Island Adventures	https://fitzroyislandadventures.com/
Fly Sea Eagle	https://www.seaeagleadventures.com/
Fraser Island Boat Charters	https://fraserislandboatcharters.com.au/

Freedom Fast Cats	https://freedomfastcats.com/
Gold Coast Seaplanes	Website removed throughout the Covid19 pandemic
Great Barrier Reef Safaris	https://greatbarrierreefsafaris.com/
Great Keppel Watersports	https://greatkeppelwatersports.com.au/
Hardcore Game Fishing	https://hardcoregamefishing.com.au/
Hooked on 1770	http://www.1770tours.com/
Hooked on Mackay	https://www.hookedonmackay.com/
Hooked up Fishing Adventures	https://www.missionbeachfishing.com.au/
Illusions – Sailing Whitsundays	https://sailing-whitsundays.com/whitsundays/illusions
Iluka Fishing Charters	http://www.ilukafishingcharters.com.au/
Inshore Fishing Mackay	https://www.facebook.com/profile.php?id=100054229160917
ISail Whitsundays	https://www.isailwhitsundays.com/
Keppel Explorer	https://keppelexplorer.com.au/
Keppel Water Sports	https://keppelislandwatersports.com.au/
Kiteboarding Cairns	https://kiteboardingcairns.com.au/
Kona Fishing and Cruising	https://www.konafishingcharters.com.au/
Lizard Island	https://www.lizardisland.com.au/
Luke Fallon Sport & Game Fishing	https://www.lukefallonsportfishing.com.au/
Mackay Fly & Sportfishing	https://www.mackaysportfishing.com.au/
Magnetic Island Sea Kayaks	https://seakayak.com.au/
Queensland	https://www.queensland.com/au/en/home
Mission Beach Dunk Island Water Taxi	https://www.missionbeachwatertaxi.com/
Night Crossing Fishing Adventures	https://nightcrossing.com.au/
Northern Conquest Charters	https://www.nccharters.com.au/
Ocean Dynamics	https://www.oceandynamics.com.au/
On the Daintree Charters	https://fishingonthedaintree.com.au/
One O One Charter	Website removed throughout the Covid19 pandemic
Passions of Paradise	https://passions.com.au/
Phantom Yacht Charters	https://www.charterworld.com/index.html?sub=yacht-
Pioneer Adventures	https://www.pioneeradventures.com.au/
Pleasure Divers	https://www.pleasuredivers.com.au/
Port Douglas Adventure Tours	https://portdouglasadventures.business.site/
Port Douglas Boat Hire	https://pdboathire.com.au/
Powerplay	https://powerplaycat.com/
Pro Dive Cairns	https://prodivecairns.com/
Prosail Whitsundays	https://prosail.com.au/
Queensland Scuba Diving Company	https://www.qldscubadive.com.au/
Queensland Yacht Charters	https://www.yachtcharters.com.au/
Quicksilver	https://quicksilver-cruises.com/
Reelcrayzee Charters	http://www.rczcharters.com.au/
Reality Fishing Charters	https://www.bigcatreality.com/
Red Baron Seaplanes	https://www.redbaronseaplanes.com.au/
Red Cat Adventures	https://redcatadventures.com.au/
Reef Daytripper	https://www.reefdaytripper.com.au/
Reef Magic Cruises	https://www.reefmagic.com.au/
Reef Sprinter	https://www.reefsprinter.com.au/
Reefstar Cruises	https://www.reefstarcruises.com.au/
Reel Addiction Sport Fishing	https://www.reeladdiction.com.au/
Reel Deep Charters	https://www.reeldeepcharters.com.au/
Rustic Pathways	https://rusticpathways.com/students/programs/countries/australia
Sail Capricornia	https://www.sailcapricornia.com.au/
Sailaway	https://sailawayportdouglas.com/
Saltaire Charters	https://www.saltairecharters.com.au/
Salty Dog Sea Kayaking	https://www.saltydog.com.au/
Scenic Luxury Cruises & Tours	https://www.scenic.com.au/
Sea Fever Sportfishing	https://www.facebook.com/seafeverfishing/
Seair Pacific	https://seairpacific.com.au/

Sealink Queensland	https://www.sealink.com.au/magnetic-island/
Southern Cross Sailing Adventures	https://www.soxsail.com.au/
Sublime Sportfishing Adventues	https://www.sublimesportfishing.com.au/
SUP Cairns	https://www.whatsupcairns.com.au/
Sweet Escape Yacht Charters	https://sweetescapecharters.com.au/
Sydney Harbour Specialists	https://sydneyhs.com.au/rhemtide-boat-sydney/
The Beach Club Magnetic Island	https://www.pilgrimsailing.com.au/adventures.html
The Keppel Barge	https://thekeppelbarge.com.au/
Tourism Australia	https://www.australia.com/
Tourism Queensland	https://www.queensland.com/au/
Townsville Watersports	https://www.ecwatersports.au/
Tropical Sport Fisher	https://www.tropicalsportfisher.com/
True Blue Sailing	https://truebluesailing.com.au/
Turtle Town Scuba	https://turtletownscuba.com.au/
Tusa Reef Tours	https://tusareeftours.com.au/
Waterline Charters	https://waterlinecharters.com.au/
Wavelength Reef Cruises	https://www.wavelength.com.au/
Whale Watching Whitsundays	https://whalewatchingwhitsundays.com.au/
Whitehaven Xpress	https://www.whitehavenexpress.com.au/
Whitsunday Getaways	https://www.whitsunday-getaways.com/
Whitsunday Rent a Yacht	https://www.rentayacht.com.au/
Whitsunday Sailing	https://www.whitsundaysailing.com.au/
Whitsunday Sailing Outrigger	https://www.whitsundaysailingoutrigger.com/
Wild Hitchinbrook Adventures	https://wildhinchinbrook.com.au/
Yongala Dive	https://www.yongaladive.com.au/

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