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Plumbing the Depths: A Critical Discourse Analysis of Thematic Metaphorical Constructions of Seabed Mining for Rare Earth Metals in French Polynesia

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Abstract

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LAKE FOREST COLLEGE

Senior Thesis

Plumbing the Depths: A Critical Discourse Analysis of Thematic Metaphorical
Constructions of Seabed Mining for Rare Earth Metals in French Polynesia

by

Lindsey M. Harris

April 14, 2014

The report of the investigation undertaken as a
Senior Thesis, to carry two courses of credit in
the Independent Scholar Program

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To my *'utuafare* in Minnesota, Lake Forest, and Tahiti.

Mauruuru roa.

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“There are many stories about this place, but this is the one that I like best.”

—Teri’imana Coulon

“In the depths of the ocean, there are mines of zinc, iron, silver, and gold that would be quite easy to exploit.”

—Jules Verne, *20,000 Leagues Under the Sea*

“This is a hazardous affair for in such an undertaking, a writer tacitly announces at the outset that he means to place some things in light, others in shade. The author has, nevertheless, long derived pleasure from the prosecution of his task.”

—Goethe

Chapter 1: Exploration

Mana, my Tahitian instructor, told me the first Tahitian myth I ever heard, the creation story of the *ha'ari*, the coconut tree. It went like this: Hina was a beautiful Tahitian princess with flowing black hair and golden skin. When she came of age, her father, the *ari'i nui*, decided that it was time for her to be wed. So, he betrothed her to a great prince, but forbid her from seeing him until her wedding day. When that day arrived, Hina laid eyes upon her future husband for the first time and was horrified to find out that he was a gigantic, ugly *puhi* or eel. Terrified, she ran away, swearing that she would never marry him. "Don't run, Princess," the *puhi* called, hot in pursuit, "no matter where you go, some day your lips are going to touch mine!" Hina did not listen. She continued running, looking for someone to save her, when she found Hiro, the fishing god, casting his line into the lagoon. "Help! Please help me!" Hina cried. She quickly explained to Hiro what had happened. Hiro nodded, and agreed to help the princess. He cut a bit of Hina's hair and baited it on his hook. The lock of hair caught the *puhi's* attention and drew him close to shore. Just as the *puhi* was about to bite Hina's hair, Hiro drew his knife and cut off the *puhi's* head. It rolled to Hina's feet, and with his dying breath, the *puhi* said, "It doesn't matter, Princess, because sometime soon your lips are going to touch mine!" Afterwards, Hiro carefully bundled the *puhi's* head in pandanus leaves and gave it to Hina. "Be careful with his head, Princess", he warned, "never put it down on the earth". With that, he gave Hina her burden and bid her farewell. Hina began her journey back home, carrying the *puhi's* head. But the day was hot, and soon Hina was sticky and exhausted. Spotting a waterfall, Hina she set the *puhi's* head on the ground and jumped into the pool for a refreshing swim. But after she came back to shore, she found that the *puhi's* head had disappeared. In its place was a beautiful, graceful tree she had

never seen before swaying in the breeze. She was commanded by the gods to remain by the tree and to protect it, making it *taboo*. But one day, famine struck Tahiti, and there was nothing left on the island to eat. In her desperation, Hina retrieved one of the trees large fruits from on high. She poked a hole in the top of the fruit, where there were three black spots, two above the third. She placed her lips on the hole she made on the third spot and drank the sweet water hidden inside. Now face-to-face with the other two black spots, Hina realized that the three spots made a face, with the top two spots forming round, black eyes, and the third making a puckering mouth. She instantly recognized the *puhi*'s face and remembered his warning that one day, her lips would meet his. Then Hina realized that the *puhi* had loved her and still did, for if not for the transformation of his head into the coconut tree, she would have died. His unconditional love for Hina sustained her. From that day onward, Hina protected the coconut tree and distributed them all throughout the islands so that people would be able to benefit from all the wonderful qualities of the coconut tree.

The origin of the coconut tree is more than a runaway bride tale; it highlights important uses, instructions, morals, and beliefs not only about the *ha'ari*, but evidences ideas of human nature and their relationship with natural resources. For example, the *puhi* is personified, giving him both human qualities and agency. In fact, the *puhi* is human enough to marry to a princess and speak on his own behalf. As human, *puhi* and the *ha'ari* enter into relationship with the human actors as equals. The outcomes of this relationship are real and visible in the coconut tree. They are so essential to communities throughout the islands that they were placed under a *taboo*, a strict prohibition upon human use of the tree as a resource. These examples suggest that animals and plants are neither passive, nor below humanity. Rather, they are actors with qualities and needs much like humans. In this case, one interacts with nature as one would interact with a

friend, a parent, or an unwelcome suitor. At the end of the narrative, coconuts flourish on Tahiti and throughout the South Pacific under the stewardship of Hina and her descendants.

There are many stories about natural resources beyond the *ha'ari* creation myth in French Polynesia, and not all them are traditional myths. They are myths of a different kind: theories, ideologies and paradigms communicated according to the strictures of various cultural regimes. In the same way that the *ha'ari* myth emphasized important ideas about human's relationship with the environment, other texts emphasize their own notions of the nature of nature, natural resources, and human's interaction with the environment. These notions are often in conflict when they intersect and play out in the minds of French Polynesians or other actors interested in natural resources. Constructions of these topics circulate in documents belonging to other genres, such as press releases by news sources, reports generated by third-party academics or interested corporations, and national and international legal documents. Like the story of Hina and the *puhi*, these documents code natural resources and natural resource management in specialized and compelling ways according to their respective agendas. New raw materials are not only being discovered, but are highly sought after as the global demand for these resources increases. As we will see over the course of this thesis, the various conceptions of a certain natural resource, rare earth metals (REM), circulated by different cultural regimes impact their extraction, use, and management. An understanding of the historical context of Tahiti and mineral extraction in the Pacific will form the foundation and impetus of this discussion on the complex reality posed by seabed mining and REM.

Introduction to Tahiti

Tahiti is located deep in the South Pacific Ocean, the largest of the 118 islands that make up the five archipelagoes of French Polynesia (CIA, 2013). First populated by humans between 400 and 900 C.E., Tahiti developed into a thriving and complex society with a political system of interrelated and competing chieftains, land and reef tenure, calendars, rituals, oral traditions, and art well before European colonists arrived (Salmond, 2011). Tahitians were renowned navigators and seapeople; They traded, sent political emissaries, spread religious cults, and used oral traditions such as smell, stars, tides, and the presence of specific species of birds to navigate the Pacific. (Diaz, 2012; Varela, 1913; Finney, 2007).

Over the next half century, the subsequent expeditions of Wallis, Louis de Bougainville, James Cook, and William Bligh continued to draw attention to these islands and their peoples. English and French missionaries arrived to convert, educate, and ‘civilize’ the Tahitians through trade and Christianity (Henningham, 1992). France and England competed for Tahiti as a strategic military and trade port (1992). Eventually, France outmaneuvered England by forcing Queen Pomare IV to annex Tahiti to France in 1843 (1992). Since then, Tahiti has experienced waves of immigration from metropolitan France, other islands throughout the south Pacific, China, and most recently, curious tourists from Europe and the United States. Tahiti is now considered a *pays d’outre mer*, maintaining its own budget, laws, and presidency. However, France continues to oversee Tahiti’s defense, education system, economic subsidies such as sugar, rice, and bread, (1992). Some Tahitians including the current president Oscar Temaru, advocate for Tahitian independence. The call for independence and solidarity among French Polynesians and across Oceania began with the atomic weapons tests conducted by the French government on the atolls of Mururoa and Fangataufa (Hau’ofa, 1994). Pacific

scholars, artists, and concerned individuals and groups responded by creating an education and arts renaissance that reintroduced Tahitian into the school curriculum, started a thriving literary movement, and a renewed interest in traditional crafts, skills, and art (Devantine, 2009; Toyama, 2006). Despite this movement, concern remains that Tahiti will not be able to sustain itself considering that Tahiti relies heavily on French subsidies and imported food and goods, has limited exports, and has a rising population of homeless and unemployed citizens (Kahn, 2011). Today, Tahiti's political, social, and economic landscape is multifarious and complicated by a history of colonization and the decolonization project.

History of Resource Extraction in the South Pacific

French Polynesia has known a long and contentious history of mineral resource extraction. In fact, in many cases, the colonization of the South Pacific was motivated in part by powerful, European nations' desire to ensure access to reserves of mineral resources such as gold, silver, and iron. In pre-colonial times, however, Tahiti was not a metallic culture. Though the stray nail, knife, or cannon parts found their way on Tahitian shores before European arrival, Tahitians used primarily shells, coral, stone, basalt, and obsidian to fashion harder objects (Henningham, 1992). Though metals were not found in excess in Tahiti, European explorers did come into contact with indigenous populations with sophisticated management practices of organic resources. In particular, Tahitians had developed a knowledge system that included the names, behaviors, and haunts of many species of marine life, established special names that classified the sounds of different waves breaking, and recognized the right of certain powerful individuals to instate *taboo* a permanent restriction on a location, species, or practice (Newell, 2010).

A particular example of traditional Tahitian resource management was the *taboo* and *rahui* system. *Taboo* were put in place by *ari'i* and local chiefs for political, ecological, economic, religious, and personal reasons, thereby restricting a particular lagoon or a certain species of fish had ramification that spanned these motivations (2010). Likewise, *rahui*, a weaker, temporary version of a *taboo*, limited a place or a species for a season, allowed stocks time to replenish, demonstrated the power of local chiefs, and ensured a supply for the future (2010). In both cases, *taboo* and *rahui* were important cultural practices that maintained the supply of resources by recognizing the limits of certain plants and animals. Furthermore, these practices were coordinated throughout the Tahitian calendar composed of cycles of restriction, when Tahitians depended on their food stores and the few crops that fruited during these periods, and abundance, when many species of plants such as breadfruit and animals such as pigs and fish were ripening and plentiful (2010). In this way, Tahitians had carefully observed the native, local species for generations to develop methods that ensured a measure of protection for these resources from famine, drought, and exhaustion from overuse or overhunting.

By the time that European ships penetrated as deep into the Pacific as Tahiti, they had severely depleted their supplies of fresh water and uncontaminated food. Sick and starving, the respective crews of Captains Samuel Wallis, de Bougainville, Cook, and Bligh were desperate to restock their supplies. From the ship's decks, Tahiti was a verdant saving grace (Kahn, 2011; Salmond, 2009). Upon sighting Tahiti for the first time, Captain Wallis reported in his diary, "we now looked upon our-selves as relieved from all our distresses" (Newell, 2010). But the captain's ease was short-lived. Communicating with the Tahitians and safely landing upon the beaches proved more difficult than he anticipated. The HMS Dolphin, eager to provision itself and care for the sick below decks, quickly attempted trade for hogs, fowl, and fruit by presenting knives,

beads, and ribbons (Henningham, 1992). Exchange flows were uneasy, however, and negotiations were neither simple nor smooth between the two groups. Interpretations of this early contact are found in Tahitian historian, Jenny Newell's excellent historical account of ecological exchange between Europeans and Tahitians, *Trading Nautre*. Newell postulated that the intermittent skirmishes and altercations between the two groups were due to different cultural perceptions about each other, the rules of nature and exchange, and the value of the objects themselves. For example, European's highly valued hogs for their fresh meat for which they bartered incessantly (Newell, 2010). Meanwhile, the Europeans were unaware of the differences between the seasons of restriction and abundance, the *rahui* laws, and the hogs' higher status as animals possessing more *mana*, or *spiritual potency*, than others species. Thus, the Europeans were disconcerted when the Tahitians reduced the number of hogs they traded. Tahitians, on the other hand, operated and negotiated with the Europeans from their own cultural perspectives, and viewed the Europeans as stingy (2010). These differences in perceptions and attitudes colored the exchange of natural resources and often played out to mutually perplexing results. While both Tahitians and Europeans were agentive in their exchange of resources, the values, beliefs, and practices were discordant and incomprehensible to each other. Yet these differing perspectives shared spaces and objects, and people negotiated them in real life through a complex interaction of oppression, revolt, ignorance, pride, and toleration.

As production, demand, and depletion of resources increased, more of these complex shared objects would appear. By the early 1900s, the Industrial Revolution had arisen in Europe and spread to America. Factory jobs with steam-powered engines and machinery made production more efficient, available, and affordable (Foster & Bellamy, 2009). Demand for manufactured goods ensured a steady need for workers to man the

machines. In response, many people flocked from their agrarian upbringings, to work in the factories; the labor was easier, steadier, and guaranteed a paycheck (2009). This left the agriculturists who persisted far from the city increasingly responsible for feeding the hungry city masses. Farmers were pressured to grow more crops in order to meet this new, pressing demand. However, the soil nutrients had already been greatly depleted from the previous century of intensive farming. The soil constantly needed to be synthetically enriched with nitrogen, phosphorous, and potassium in order to continue supporting healthy, high-yield crops (Ashley, Cordell, & Mavinic, 2011). In the past, manure produced by animals at or near the farmsteads was rich and abundant enough to enrich the fields. However, since the soil quality was already declining and fields were being further exhausted and expanded, these immediate fertilizer sources need to be supplemented with others (Foster & Bellamy, 2009).

Farmers began searching for alternative fertilizer sources to meet the rising demand for crops. The principal development that resulted from the search for more efficient and effective fertilizers led to the discovery of guano, the excrement of seafowl. Guano was particularly rich in phosphorous, nitrogen, and potassium, three essential nutrients that crops draw from the soil (Foster & Bellamy, 2009; Ashley, 2011). This phosphorous 'rock' was a particularly cheap and useful fertilizer because it existed en masse on colonized islands in the Pacific and Indian Oceans and could be harvested through inexpensive means. In fact, countries were so interested in protecting their guano sources, that it sparked armed conflict, including the Chincha Island War and the War of the Pacific (O'Donnell, 1993).

The demand for guano also extended to French Polynesia. Makatea Island was one of the most prominent exporters of guano in the Pacific. Mining commenced on the island beginning in 1917 and cored the island with hand-dug holes (Cushman, 2013). By

1964, Makatea's phosphorous reserves were empty and the agricultural industry turned towards chemical fertilizers instead. But by then, the phosphorous boom had taken its economic and ecological toll upon the island. Phosphorous mining had made the inhabitants of Makatea wealthy, as the island became popular port of call for ships (2013). The people relied on this sole export for income and invested poorly in the continued mining of the island. When the reserves were exhausted and the demand for phosphorus diminished and the ships stopped coming to Makatea, the inhabitants were left destitute. Recently, though, Avenir Makatea, an Australian mining corporation, has developed public relations and business deals to salvage the dredges of phosphorous remaining on the island.

Nauru, another island country in Micronesia, experienced a similar demand for phosphorus that led to rapid and unstable wealth. Again, however, the islands were left economically and ecologically impoverished when the phosphate rock was exhausted through strip mining. After the phosphate mining, the country became dependent upon Australia for aid. In return for economic support, Nauru agreed to house one of Australia's penitentiaries, Nauru Detention Center (Conservation Biology, 2009). Today, Nauru is leasing out its land and coastal waters to foreign investors for deep seabed mining of rare earth elements in order to recover its flagging economy (2009).

The history of resource extraction in Makatea and Nauru are Aesopian in that they both illustrate the conflict between initial and subsequent costs and benefits associated with mining. Though newly independent island states are able to secure and buoy their income through mining, its dependency upon a limited and risky objective leads to well-known consequences such as poverty and ecological harm. Resource extraction is a well-known story in the South Pacific and though the objective resource and the technology has advanced, mining continues to present a tantalizing fix to developing island states.

They also pose a substantial political, economic, and cultural risk. Precolonial Tahitians were acutely sensitive to resource management, as were the European explorers and subsequent the colonial governments. Though initial interest in the islands was for organic resources such as breadfruit and hogs, the cycle of compliance and demand for secure and cheap resources continues.

Resource management, as evidenced by the legend of the coconut tree and Tahitian history has always been a contentious concern in Tahiti. Pre-colonial Tahitians carefully managed their natural resources such as fish stocks in the lagoons, fresh water sources, and animals such as pigs through a complex system of land tenure, chiefly prohibitions, oral traditions, and calendars that dictated when certain resources could be exploited. Europeans initially trivialized this system because Tahiti seemed like a paradise where resources were always plentiful. The island was seemingly rich in untapped and boundless sources of food, water, rest, and hospitality. Secondly, explorers found Tahiti's agricultural system to be minimal and primal in comparison to that of 18th and 19th century Europe. France, Great Britain, Portugal, and the Netherlands and other powerful European empires were rapidly amassing wealth, land, labor, and resources to meet elite Europeans taste for knowledge, curiosities, and exotic goods. Compared to the structures established in these nations, Tahiti was small, backwards, and savage. Tahiti has continued to be concerned with the management of its natural resources. Tahiti relies heavily on imports and tourism because it has few plentiful natural resources to market, save for the right to fish within its territory.

The significant difference from past cycles of resource extraction is the shift from organic, agricultural resources to the islands' mineral resources in the land and water. Resource extraction has been a fundamental incentive for colonizing and developed nations to intervene in politics, cultivate industry, and maintain a military presence in the

South Pacific. The rapidly growing interest in rare earth elements and increased political autonomy but weakened economy in French Polynesia reverberates with much of the same experience of islands such as Nauru and Makatea. The conflict of past, present, and future interests, costs, and benefits will require significant political, economic, and social arithmetic and introspection. The relatively recent discovery and demand for REM, manganese nodules in particular, has drawn more national and international interest into concepts of natural resource management in Tahiti.

Though the extraction of valuable geological materials has ancient origins, consideration of deep-sea mining of manganese nodules did not begin until John Mero's paper, "Manganese Nodules" in 1952. At that time, the technology to dredge, extract, and refine the minerals had not advanced far enough, and mining companies were at loath to take on such a high risk. Nations such as the United States and France funded research vessels to assess the quality and amount of nodules, but found that Mero's account to be exaggerated (Barkenbus, 1979). Thus, land-based mining was more economically sound.

This began to change, however in the 1980s, when the price for elements such as copper and nickel began to rise. Technology, especially the rapidly increasing number of transistors able to be fit on an integrated circuit increased the demand for REM (1979). Scientists and entrepreneurial businesses began to take notice of the benefits of seabed mining such as the abundance of quality nodules available, the 'low environmental impact' of gathering them, and the security of an amassed, ensured supply for a business or state (1979). Beginning with the discovery of large manganese nodule fields throughout the Pacific Ocean, nations such as Japan, China, and Korea launched more aggressive research vessels to study the manganese nodules. Researchers were interested in supplementing their stores of natural resources for their nanotechnology production. A

major catalyst for the recent surge of interest in seabed mining came from a study by Kato et al. on the economic viability of resources on the seabed. The findings showed that many high-quality, nodule-rich seabed fields existed within the exclusive economic zone (EEZ) of French Polynesia (1979). Though some fields existed in the “Area” beyond French Polynesian and other national territorial claims, they were considered part of the “common heritage of mankind” in the preamble of the United Nations Convention on the Law of the Sea (UNCLOS) and hence subjected to transnational taxes and restrictions (1979). Instead, mining companies have found obtaining the rights to deep seabed mining for REM from national governments more economically feasible.

Lastly, alternative narratives circulating throughout French Polynesia support a return to more traditional constructions of natural resources and natural resource management. The experience of Makatea Island and Nauru has added to a legacy of cultural renaissance through an embracement of traditional management practices. For example, French Polynesian fisherman, poet, and activist, Henri Hiro, advocated for *pareo, rahui*, traditional navigation, and canoe-building in his poetry, plays, and interviews. Although Hiro did not write about seabed mining or REM, he used thematic images such as the parent-child relationship and sacredness to illustrate an intimate, symbiotic relationship between natural resources and humanity. In one of his most famous poems, "*Ia ora te natura*" Hiro wrote, "A toi, Orohena/Qui se dresse dans le ciel immense/ Toi, le sommet qui chante mon pays/Tahiti du monde polynésien, embrasse-toi du grand amour/Et enfants et descendances chéries/Pour quelques viennent le roc et le réceptacle pour l'homme du pays à tout jamais" (Mairai & Coeroli, 2013). Here, Hiro depicted the land as an entity with human-like qualities and abilities, such as singing and tenderly kissing its children. This literary device suggested that natural features such as the mountain and the land were active entities that could act and interact with

humans. Management and use of the environment and natural resources reflecting this relationship would impact the way that Tahitians would view and use natural resources, even those not mentioned in Hiro's poems, because to do otherwise would break down the health and integrity of the relationship. Furthermore, constructing the environment in a way more in line with Hiro and traditional Tahitian epistemology stood in contrast to some of the interactions globalization and colonial powers had with the natural world. The loving and nurturing qualities and relationship Hiro portrayed seemed fundamentally at odds with the passive position of natural resources in the modernizing and globalizing context perhaps best evidenced by French Polynesia's experience with mineral extraction and nuclear testing. Although these poems did not deal directly with seabed mining, they supported a strong sense of dependency upon the bounty of nature and the interest in conserving its stocks and replenishing cycles. Although REM were not among the resources Hiro was originally concerned with, their location in the ocean and their potential to turn a profit that could support Tahitian independence make applying his conceptions of natural resources and human interaction to them an easy connection.

These differing perspectives on REM mining in the Tahitian seabed represent different, powerful cultural interests and values concerning natural resource use and management. Actions by one group party to seabed mining will affect others in ways aesthetic, health-related, financial, cultural, or otherwise. Though seabed mining poses a complex reality, beginning to understand some of the paradigms framing REM extraction furthers understanding of others, ourselves, and the complicated relationship between humans and their environment.

Chapter Review

Chapter Two: Field is a literary review about culturally entangled objects such as REM mining. I begin by exploring the main theme in Nicholas Thomas', *Entangled Objects*. Thomas argued that objects in a culture are not passive vessels for meaning. Rather, they are the vehicles through which different groups negotiate their respective cultural perspectives. In short, these objects are deeply entangled in the values and beliefs of different cultures. Although to date, little anthropological work has delved into seabed mining, both the ocean and mining have well-researched bodies of work. The ocean and mining are two examples of the culturally entangled nature of the environment and natural resources. Then, attention is turned to REM, the main object of inquiry analyzed by this thesis.

Chapter Three: Extraction is the data section. First, a definition of metaphor and genre are offered as units of measurement and organization of data points. Following a review of the methods is a Fairclough-styled critical discourse analysis comprised of a two-stage thematic metaphorical analysis. This analysis isolates, compares, and contrasts metaphors within and between cultural regimes. The results of the first stage of analysis provides a sketch of the metaphorical content concerning natural resources, natural resource management, seabed mining, and REM in documents ranging from press releases, reports, and poems, to laws. The results of the second stage of analysis revealed thematic metaphors that tended to be characteristic of or found across different genres.

Chapter Four: Nodules is a discussion of the findings. In this chapter, the conflicting and consonant thematic metaphors are discussed. Laws did not appear to have thematic metaphors in common with either reports or press releases. However, thematic metaphors were found in common between reports and press releases.

Implications about cultural constructions and their interaction in the real world are articulated. Furthermore, directions for future research on this topic are suggested.

Chapter 2: Field

A foundational framework necessary for examining the dialectic nature of the seabed mining and REM comes from an ethnographic work conducted in Fiji. In Nicholas Thomas's seminal work, *Entangled Objects: Exchange, Material Culture, and Colonialism in the Pacific*, the author delineated the web of entanglements valuables and social actors are engaged in. In his analysis, artifacts exchanged between Fijians and European colonists such as jewelry, whale teeth, and animals were the central objects of study (Thomas, 1991). By tracing the ways these objects were conceived, interpreted, and used by both groups, the reader glimpsed the subtle dynamics behind individual and community behavior. Thomas concluded that "tradition" in Fiji functioned as a reference point that was reviewed and revalued into active neo-traditional ideology and practices, such as kava drinking and participation in major ceremonies (1991). This contrasted with white, colonial values and customs, what some Fijians referred to as the "path of money". The Fijians conceived the path of money as a way that neglected the daily traditional practices. In effect, Fijians and colonists found themselves in "a dilemma between two paths: the way of the land and the way of money, which are seen to stand in tension, if not to be incompatible" due to a difference in the cultural constructions of morality of value maintained by the two cultures (1991). The tension between the paths created "struggles which always take place within both the metropolitan project of colonialism and the indigenous project of appropriating or reacting to colonial intrusion" (1991). Fijians were confronted with conflicting ideas and struggled to reconcile them in everyday life. Some Fijians would accept the "path of money". However, other, more culturally conservative individuals viewed them as wayward and lost. Conversely, Fijians who took wage jobs, received an education, and began accumulating money viewed the conservatives as backwards and lazy. These perspectives existed

simultaneously and were reflexively evaluated, judged, and critiqued by both positions (1991).

Although Fiji gained independence from colonial powers, the values, behaviors, and goods introduced by colonists left a polarizing society in its wake. Evidenced by Thomas, entangled meaning revealed “the dialectic of international inequalities and local appropriations; it energizes a perspective situated beyond the argument between proponents of the view that the world system is essentially determinate of local social systems and those asserting the relative autonomy of individual groups and cultures” (1991). In other words, indigenous knowledge systems have specialized knowledge and wisdom that exist outside of the awareness of world systems. The information gathered, and used by local peoples helped them to order and manage their environment according to their cultural principles. Ideologies underlying traditional resource management practices were efficient and effective at regulating their spheres of influence in the environment and the socio-economic and political landscapes (1991). Here Thomas demonstrated how the various constructions of an entangled object ultimately led to larger scale currents of cultural life. Thomas found that participating and not participating in traditional practices was evidence of the contrast and negotiation of the traditional and Western conceptions of objects such as money or kava drinking. The choice to participate or not became a political expression that expressed an individual’s complex, internalized ideas about traditional ceremonies and Western practices (1991). Thomas concluded that tracking culturally salient objects revealed the interface of the globalizing and neo-traditional ideologies. Everyday objects were revealed as complex realities where people give value, weigh priorities, receive conflicting feedback, and ultimately make difficult choices with political, economic, and social ramifications.

French Polynesia is the site of similarly entangled objects. In the past, objects such as hogs and breadfruit were active in the interactions between Europeans and Tahitians and humans and the environment. Today, manganese nodules and other REM are entangled in the multifarious meanings imposed upon them by various groups. The notion of entangled objects is a fundamental concept in this thesis. As with the cultural objects Thomas indicated in his piece, the differing cultural constructions about seabed mining and REM bear upon these phenomena in the real world. They too are entangled in the expectations, values, and beliefs of different groups of people. Understanding the nature of seabed mining and REM and making decisions concerning them requires a negotiation of these social facts in order to generate sustainable and successful solutions.

Anthropological research about cultural forces bearing upon seabed mining is scarce. However, understanding various cultural constructions of the ocean, where this new enterprise takes place, and mining, its goal and process, is an adequate place to begin framing seabed mining and REM. A cursory glance into other cultures reveals the oceans's centrality and pull for many other peoples. In Stefan Helmreich's, "Nature/Culture/Seawater", water is continuously interpreted and reinterpreted across different cultures over time. Helmreich pointed out that water's physical properties, such as mutability, lend water to metaphorical use in indigenous epistemologies, modern science, and in the discipline of anthropology and ethnography proper (Helmreich, 2011). Each interpretation of water in its many forms serves as an important conduit of meaning between individuals, communities, and generations. Helmreich contended that the way that cultures viewed water differed and had lasting and consequential implications for the way that people interacted with water (2011). Two examples Helmreich used to illustrate water's metaphorical flexibility were the Bible and in 19th century travel literature. The Bible used water and its many forms as a potent motif

through which readers understood their dependence upon God as the source of life. There are many examples of the necessity and sacredness of water in the Old Testament. For example, in Amos 5:24, the author wrote, “For my people have committed two evils: they have forsaken me, the fountain of living water, and dug out cisterns for themselves, cracked cisterns that can hold no water” (Jeremiah 2:13, International Standard Version). Here, water was a metaphor that compared God as the source of eternal life with the biological necessity for water. In the same way that water satiated thirst and watered the crops and animals, so did God sustain the life of the soul. Without these waters, fishing, irrigation, and travel would have been impossible and life in the Eastern Mediterranean region would be unsupportable. Likewise, in the new Testament, references to water, such as the ocean, fishermen, and floods, stood as important metaphors through which Christians have interpreted and understood the role and importance of God in their lives.

Helmreich also pointed to constructions of the ocean in western travel literature. During the 1800s, water represented the dichotomy of life and death, freshwater and salt water for Europeans at sea (Helmreich, 2011). The supply of drinking water constantly weighed on the minds of crew and captains braving the open ocean. At the same time, the crew was also aware that they were at the mercy of the vast and unpredictable ocean. This is evidenced by Captain James Cook’s diary of his voyage to the South Pacific in 1768.

“Still we had hardly any hopes of saving the ship, and full as little our lives, as we were full 10 Leagues from the nearest Land, and the boats not sufficient to carry the whole of us; yet in this Truly Terrible Situation not one man ceased to do his utmost, and that with as much Calmness as if no danger had been near. All the dangers we had escaped were little in comparison of being thrown upon this reef, where the Ship must be dashed to pieces in a Moment. A reef such as one speaks of here is Scarcely known in Europe. It is

a Wall of Coral Rock rising almost perpendicular out of the unfathomable Ocean, always overflowed at high Water generally 7 or 8 feet, and dry in places at Low Water. The Large Waves of the Vast Ocean meeting with so sudden a resistance makes a most Terrible Surf, breaking Mountains high, especially as in our case, when the General Trade Wind blows directly upon it” (Cook, 1768).

Even within this first chapter of his diary, Cook feared the ocean and was acutely aware of his mission’s vulnerability to the high seas. While many descriptions in the Bible associate water with a divine or life-giving source, Cook’s strong imagery to illustrate the strange and beastly nature of waters far from English shores stood in stark contrast. His diaries are full of strange reefs, high winds, and enormous waves. This entry demonstrated Cook’s construction of the ocean as a terrifying place, even as Cook was a Christian man well-versed in scripture (Boeger, 2012).

In these two depictions of the ocean, different characteristics and behaviors of the water are stressed. In the first, the water is pictured as a fountain, as a peaceful and manageable water source. Water’s ability to soothe, replenish, and rejuvenate the physical body is compared to God’s ability to renew an individual’s spiritual body. This connection made water sacred to the body and to the soul. Meanwhile, Cook’s understanding of water came from his experience of the ocean. The ocean was a “Truly Terrible Situation” full of strange and dangerous forms. The gusts off of the water creating huge waves and precarious reefs made Cook’s water appear monstrous. These examples illustrate Helmreich’s conclusion that water is a particularly useful metaphorical device across many documents and genres. Just as the constructions of water and ocean in the Bible and in Cook’s diaries compounded and conflicted, so too do constructions of water between cultural groups conflict today.

Mining as a subject of anthropological inquiry has a significant and growing corpus of research to consider. Michael Taussig's *The Devil and Commodity Fetishism in South America* analyzed the ways Quechua-speakers in Bolivian mines conceptualize and interact with mining and its resources. He found that the miners believed the devil, *el tío*, could be persuaded through ritual libations to replenish the mineral reserves and determined their safe passage in and out of the mine (Taussig, 2010). Taussig concluded that framing *el tío*, his interaction with miners, and his control over the mines as a mere social-unification and coping device minimized the varied nature and meaning of these phenomena (2010). Ricardo Godoy later summarized Taussig's realization in his 1985 overview of anthropological perspectives on mining. Godoy stated that concepts of *el tío* were not always present or active within the mining community (Godoy, 1985). In fact, prior to the development of capitalism and the erection of the mines, the community had practiced reciprocal rituals to *pachamama*, the mother earth spirit. This gave way to the frequent libations required to appease *el tío* (1985). In this example, mining from the perspective of the Bolivian miners is explained as a culturally dense practice, deeply entangled in the struggle, needs, values, and beliefs of a group. Both conceptualizations fundamentally bear upon the audience's and the miners' bear upon mining itself.

In response to Taussig's "monolithic" treatment of corporations, state, and community, Chris Ballard and Glenn Banks' article, "Resource Wars: The Anthropology of Mining" pointed out that since Taussig's research, economic demand for mineral resources have surged, particularly in the 1980s (Ballard & Banks, 2003). Understanding the implications of this increase for the environment, miners, businesses, and states demanded a review with nuanced conclusions about appropriate decisions concerning mining. For one, there were the various actors' conceptualizations to contend with and

ethnographer's constructions of mining and its implications. All of these positions, whether the mining firm, the state, mining communities, and the attending ethnographer interact in the academic sphere, and in some cases, have changed the facts on the ground, as anthropologists have involved themselves in the social, political, and economic realities of the volatile places they study (2003). Mining has taken place in largely indigenous communities, and today, changes in international law enhancing protection for indigenous people's rights and the inclusion of these groups in development have blurred the lines between the Godoy distinctions between state, corporation, and miners (2003). Furthermore, the authors pointed to the breakdown of the traditional ideas of the nation-state to shifting roles they take in multinational mining activities. Most interestingly for the ends of this thesis, Ballard and Banks noted that disagreements frequently sprang up between states and local communities about ownership of mineral (2003). The authors cited locals engaged in nickel mining in Papua New Guinea as an example of contention between the state and local individuals over property rights. They stated that, "land serves as a convenient discursive point of reference to ties to locality and to kin" whereas the mining industry, "is concerned primarily with securing access and leasehold rights to territory and only secondarily with questions of engagement with local residents" (2003). Lastly, Ballard and Banks also stated that anthropologists, states, corporations and local residents must reconsider and engage in mining with these considerations in mind in order for it to be just, safe for human health, respectful of indigenous peoples, and safe for the environment (2003).

Conceptions of the ocean and mining are evidently complex, as features of mining are constantly interpreted and reinterpreted by cultural groups. In his 2002 keynote address to Maritime Studies International Journal, MAST, entitled, "People and the Sea: A 'Tropical-Majority' World Perspective", John Kurien predicted that in terms of natural

resources, the 21st century would revolve around the ocean. “Just as we have begun to realize the importance of the tropical forests,” he stated, “We will begin to become aware of the ecological sanctity of the “seacosystem” for the survival of the human species (Kurien, 2002). The similarities and dissimilarities of the seas and oceans which wash the coasts of our countries, and the variety of ways that people relate to them for livelihood and leisure, will become major negotiating themes in future” (2002). Kurien followed this statement with questions that revealed the precarious and multi-stake position of the ocean in contemporary politics, academics, economics, and ecology. Research into such issues as the impact of civic society upon national and intra-governmental policy or how access to terrestrial and oceanic resources could be combined to provide for a structure of overlapping diachronic, spatial, and resource appropriation rights to a set of multiple users with minimal negative reciprocal externalities among them served as illuminating cases to study the transitional processes between local and global and theory and action (2002). Looking ahead, Kurien and many other contributors to MAST predicted that multiple-interest conflicts surrounding oceanic resources were on the horizon and would require preemptive research and self-reflexive processing in order to consciously and efficiently manage them.

Seabed mining is certainly a source of competition for oceanic resources. Demand for REM increased with the rise of nanotechnology such as permanent magnets and lasers (Bashir et. al., 2012; Barkenbus, 1979; Ghosh & Mukhopadhyay, 2000). This thesis is concerned with manganese nodules in particular, lumps of minerals comprised of nickel, iron, manganese and other rare earth elements, REE. These nodules formed on the seabed at depths of 4000 to 6500 meters (Ghosh & Mukhopadhyay, 2000). They are formed by chemical reaction between the cold, bottom water and fluids excreted from the earth’s crust with contain manganese and other oxides (2000). Though

nodules form relatively slowly, they range in size from microscopic to a size more economically feasible for mining at 5 to 10 centimeters in length (2000). Though the market for REE and REM has been historically stable, trend forecasters predict that the demand for REE oxides for ceramics, lasers, and permanent magnets and the decreasing reserves and minerals traded between countries will boost the market for these minerals in the near future (Bashir et. al., 2012; Barkenbus, 1979). In fact, this thesis was precipitated by a study by Kato et. al. that found a large reserve of REM and REE in the eastern South Pacific, including within French Polynesia's EEZ (Kato 2012).

China has dominated the exportation of REM to countries such as the United States and Japan (Bashir et. al., 2012). However, China has begun to stockpile its own supply of rare earth elements in order to sustain its mass population and factory production of electronics (2012). In order to ensure a steady, continuous supply of rare earth elements and to lower the price of production in the competitive globalized economy, mining companies and nation states began looking for alternative sources of REM (2012). Research generated by these companies and academia has pointed to twenty-five sites in the eastern South Pacific with REM greater than 400 ppm, denoting that the profit gained from mining REM in these areas are greater than the cost of exploration, development, and production (2012).

This thesis was precipitated by these findings and the hotly debated topic of seabed mining amongst many French Polynesians in the summer of 2013. While touring the Jardin de Paofai, my guide mentioned seabed mining in French Polynesia to me for the first time. Incensed, he lamented the harm to the ocean and its unsustainable prospects for the French Polynesian economy. However, when brought up in conversation with other locals, they expressed a range of responses from optimistic, to on the fence, to cynical or outraged. Listening to these conversations, it became apparent

that as people expressed their opinions about seabed mining and the rare earth minerals that individuals were concerned with different things, whether that was job security, neo-colonization, human health safety, or the health of the environment. In fact, seabed mining and REM seemed to be conceptualized, valued, and weighed differently between people's minds. It seemed that while different cultural groups agreed that seabed mining and REM there, the way individuals spoke about them was sometimes consonant and other times discordant. Whichever the case, these similarities and differences caused both tension and surprising moments of consensus between speakers. This presented an intriguing topic of study, and I hope one that can offer insight into the dynamic nature of seabed mining and REM. Moreover, I hope it illuminates some of the bedeviling complex reality posed by natural resources and human interaction with the environment.

Chapter 3: Extraction

Examining the various perceptions of seabed mining requires an extraction of a different kind. Following the Victor Turner and Clifford Geertz tradition of translational anthropology, choosing a medium of culture, whether myth, practice, or material object, requires an interpretive act in which the anthropologist translates the ineffable significance of a cultural aspect in order to be understandable to the reader. The entire enterprise of interpretation, however, is wrought with problems, as the anthropologist will inevitably struggle to glimpse the unspeakable *intentio* motivating or animating a cultural artifact. This is due in part to the cultural perspective from which the anthropologist writes from and the way he or she positions and represents him or herself and the community they are observing. Hence, hermeneutical act of the anthropologist is a partial, harmonizing work that glimpses and compliments a bit of reality. Yet, though an anthropologist studies texts, pottery shards, rituals, or ritual objects, behind these artifacts are real people with histories and agency themselves. Anthropology is interested in culture inasmuch as it attempts to understand real people, real lives, and real experiences. Beyond this, the anthropologist always interprets from his or her own cultural vantage point. In other words, mining meaning from cultural phenomena is work made gritty and clumsy by the dense cultural matter it is embedded in and that the anthropologist and audience tries to look through.

Methods

Linguistic anthropologists are concerned with culture, the taught, socially-generated things, actions, attitudes, and paradigms that comprise the human and human experience, evidenced by the way language is used. Descriptive linguists approach language as an arbitrary and conventional system of symbolic systems that relates sound

to meaning and meaning to sound. Linguistic Anthropologists look beyond this mechanical definition to interpret the culture that both structures and is structured by thought, action, and experience.

Discourse, defined by Barbara Johnstone in her instructive book, *Discourse Analysis*, refers to “actual instances of communication in the medium of language” (Johnstone, 2002). People construct themselves in discourse by using it to create, refine, and affirm the creation of their identities (2002). Most notably for the ends of this thesis, discourse demonstrates how the speaker presents, legitimizes, and exerts language’s power to reveal and obscure perspectives (2002). Therefore, discourse operates as cultural fact shaped out of grammatical rules, concerted effort, and culturally held conceptions and perceptions. Humans have multiple roles, affiliations, and identities and engage in discourse according to each of them. Thus, humans dwell in a tangled, compounded world of narratives that conflict and evolve. Discourse has normative and transformative power in social realities, and is neither neutral nor natural in its deployment (2002). Lastly, linguistic representations of events and objects vary between communities. Therefore, understanding these representations demands a cross-cultural, hermeneutical effort in order to attempt understanding and negotiation (2002).

While there are many ways to study language and its relationship to culture, Norman Fairclough used discourse to examine the power dynamics between cultural groups. Originally, Fairclough formulated his brand of critical discourse analysis to investigate how minority cultures operated within a capitalist framework. By observing the way that speakers from different cultural regimes talked about a volatile subject, the anthropologist could begin to discern some of the contours of minority ideologies and their interaction with dominant ones (Fairclough, 1992). In his analytical framework for informing critical discourse analytical methodologies, Fairclough asserted that a

phenomenon should first be conjectured and described as a contentious social quandary. That is, critical discourse analysis best serves to articulate some insight into complex social problems and their solutions (1992). Fairclough's brand of critical discourse analysis has three broad characteristics: firstly, it is relational, meaning its focus is the social relationship between cultural parts. Secondly, it is dialectical, and thirdly, that it provides insight into interchanges between cultural regimes (1992). Also, application of critical discourse analysis can be used to evaluate the space between cultural regimes in different disciplines (1992). Ultimately, Fairclough's critical discourse analysis illuminates the political nature and effects flowing from the language groups use to talk about a discursive object.

Investigation into the relationship between language and culture is fuzzy and elusive because these investigations require the deep study of an event of historical heritage that is produced and reproduced in the space between members of a speech community in speech events or texts. Discourse analysis is concerned with instances of discourse, moments of language communication in both written and spoken forms. These forms, also referred to broadly as "texts", can be analyzed through various theoretical frameworks and levels of language. For example, the quintessential linguistic anthropological study conducted by Benjamin Whorf in "The Relation of Habitual Thought and Behavior to Language" extrapolated the normative power of language to shape perception of reality depending on one's native language by examining how tense in Hopi is used and bears upon concepts of time (Whorf, 1941). Additionally, Miki Makihara's analysis of code switching between four dialects on Easter Island is an excellent example of discourse analysis of verbal speech acts at the morphemic and syntactic sentence level revealing identity affiliation and cultural power dynamics (Makihara, 2001; Makihara, 2005). Furthermore, the more recent book by K. David

Harrison, *When Languages Die*, provides a colloquial and passionate overview of the cultural meaning embedded in the lexemes, metaphors, and genres of endangered languages (Harrison, 2007). As evidenced by the variety of objects of inquiry exemplified above, researchers' methodologies must be equally flexible and versatile. Metaphorically speaking, discourse analysis can be likened to the thought of as a series of fish traps that are cunningly designed by a fisherman to catch a particular fish, but allow others to pass through (Waiko, 2003). The aforementioned linguistic anthropological works and many others all make a point to glean insight into the constructions, and attitudes pervading a culture's perceptions by considering a systematic method of analyzing various levels of discourse, from the phonetic to the semantic levels, to uncover underlying power dynamics.

Closely in line with Bruno Latour's "The Recall of Modernity" and Michel Foucault's "The Archaeology of Knowledge and the Discourse on Language," discourse analysis does not seek to reproduce the culture they study or the utterances of a specific speech event. Rather, it seeks create a harmonious interpretation compatible with its original and understandable to the linguistic anthropologist and his or her audience (Latour, 2007; Foucault, 1982). Thus one of the main objectives of discourse analysis is to describe the linguistic object of interest, its form, its function, its context etc. Beyond this, Johnstone cautioned, "Beyond this, descriptive work presupposes that it is possible to describe the world—in other words, that there is not an infinite number of possible descriptions, any one of which would be valid in some situation and...the proper role of a scholar is to describe the status quo first, and only later, if at all, to apply scholarly findings in the solution of practical problems" (Johnstone, 2002). Discourse analysis provides a methodology that systematically filters and organizes linguistic data to

produce revelatory and meaningful insight into underlying cultural issues, attitudes, values, and beliefs held by a group.

The following methods are based on the Fairclough model of critical discourse analysis. The characteristics of this framework provide necessary tools to investigate the complex and shifting reality of seabed mining. This framework provides a means to observe how various cultural narratives function and interact with each other. It provides evidence for the claim that different cultural regimes construct the same phenomenon differently and that the interaction between these different constructions generates exotic, strange, and awkward moments of conflict and similarity. Seabed mining has become a hotly debated topic throughout French Polynesia, in boardrooms and in newsrooms. Different cultural regimes are processing and discussing the same topic, but to different ends. What is the difference between the reaction of a local fisherman on Huahine, a state official from Papeete, a scientist or engineer in Australia to seabed mining? Perhaps even more interesting, how does a child who grew up on an outer island and attended law school in France experience conflicting conceptions of seabed mining? It can be inferred that these opinions, concerns, and values would be congruent and at variance in different situations. However, evidence of this hypothesis and why these differences and similarities occur is more difficult to produce. Fairclough's critical discourse analysis goals and methods illuminate the complex interactions between dominant and minority cultural regimes.

Seabed presents a compelling and bedeviling prospect for French Polynesians is the exact sort of social quandary Fairclough intended his critical discourse analysis to be used for. However, due to limitations on access to verbal discourse pertaining to rare earth element mining in French Polynesia, this study focuses on written texts including, international and national laws, press releases, and reports circulated by governmental

agencies and mining corporations. Each of these texts have a particular motivation, audience, and form which presents, obscures, and assumes different information and positions accordingly. Though not all French Polynesians have read and been directly impacted by the texts selected for analysis, each text is a token that exemplifies some of the relevant and differing cultural interests that are felt and considered by them. Panning for metaphors and considering how they are employed within the context of a particular genre reveals the interaction of cultural affinities and power. Examining some of the documents and constructions surrounding seabed mining in French Polynesia will make visible some of the assumptions and positions embedded and wielded by cultures with stakes in seabed mining.

The thesis bases its methodology from similar critical discourse analytical studies, most notably, Elanor Lamb's recent study of the diachronic role of immigrant organizations in the United Kingdom (Lamb, 2013). Lamb formulated a 'three-tier' approach which included an investigation into the conditions and context of civil society at the time the texts were released, a categorization of the various social organizations used as a heuristic device for some of the social regimes operating and affecting the topic, and a textual analysis that examined how each actor's representations of immigrants (2013). Similarly, this thesis first categorizes the texts by social organization, their respective "fields of action" (see Wodak & Meyer, 2001), and finally their genre. The genre of the texts, which range from federal and international law to news articles will then be analyzed as illuminating and obscuring frameworks. Afterwards, a textual analysis of the metaphors in each text will evidence attitudes towards natural resource management through linguistic relationships and comparisons. The data analysis portion of the thesis concludes with an exploration of the dynamics of power and resistance across the genres and token metaphors.

The design of the thesis is three-fold. Genre is a set of conventions a cultural regime uses to frame information. The conventions are characteristic, but not exclusive to a genre, however, by loosely defining the general field of action within a genre and its parameters, distinct cultural regimes working within press releases, reports, and laws are revealed. This step is necessary for later analysis between these genres. Afterwards, a general overview of metaphors and thematic metaphors are provided. These are the fundamental units of measurement in this thesis because they provide evidence for values and concerns a cultural regime has concerning natural resources, natural resource management, seabed mining, and REM. This is followed by a two-step thematic metaphor analysis, where each document is coded for metaphors concerning natural resources and natural resource management, seabed mining, and REM, when applicable. Some points where the metaphorical comparison between two phenomena is similar and some of the points where the comparison between the two phenomena resolves into incongruence are analyzed. This first stage sketched the metaphorical content of each document. The second stage organized these documents by genre and looked for thematic metaphors therein. Afterwards, significant attention is paid to the moments of congruence and incongruence between thematic metaphors.

Genre Theory

Genre is a term widely used to differentiate kinds of a medium, say, a romantic comedy movie from a thriller, a science fiction novel from a science textbook, or a cubist rendering from an impressionist one. Genre studies scholar, Mikhail Bahktin, defined genre as a “historically transmitted, relatively stable framework for orienting the production of discourse”, thus implying that the distinctions between kinds are evidently more than intuitive (Foley, 1997). Bahktin theorized that these frameworks signal

important clues to the audience about how to contextualize and understand the information therein. These signals can be as fine grain as phonetic to as broad as organization or form. Genre then marks distinctions based on frequently appearing groups of shared signals, Bahktin called “moves.” J.M. Swales best summarized Bahktin’s definition of a “move” as “a text segment that can be identified by its particular linguistic clues. The move allows for a specific function within a text to be met and almost always signals the content of a particular discourse within a genre. A genre, therefore, is constructed based on moves, with each move leading to the overall coherent understanding of the text” (Swales, 1981). Therefore, precise combinations of moves not only characterize and make a genre recognizable, but also influence the manner of comprehension by sequencing the flow of information. For example, consider the haikus, a recognizable genre of poetry. Haikus are highly characteristic poems: their strict 5-7-5 syllable formula indicated a specific structure through which poets were required to demonstrate their acute creativity and elegance within this limit. The syllabic structure constitutes a convention, a move that is recognized by a specific cultural group (1981). Therefore, any haiku is written already connected to past haikus and perpetuates and guides evaluation of subsequent ones.

These moves are recognizable and indicate a specific frame through which the following information should be understood. However, they are not universally held across all cultural groups. Rather, they vary widely, demonstrating the social and arbitrary nature of genre. The integrity of the combination of moves comes from its vertical transmittance from past work. Its horizontal contextualization within current work defines a genre. Actors shape meaning and understanding through these conventions. Genre facilitates shared understanding and creates a mutual relationship of expectation and understanding between the author and the audience. The structures

propagated by one culture are not necessarily recognized in another. For example, Foley examined Kuna, in which lexemes used in curing rituals differ from those spoken in everyday Kuna (Foley, 1997). Hearing this shift in lexemes, the audience knows that the genre has shifted, hence to understand and participate, they must draw upon the cultural knowledge of ritual language lexicons, their meanings, stories, and traditions associated with this particular event. In the example of lexical shifts in Kuna, the use of ritual language indicates a special place and time in which banal objects and processes are reconsidered and related in the shared context of past performances and traditions. Likewise, in Shakespeare's Sonnet 14, the repetitive stress patterns linked ideas such as "astronomy", "plague", and "luck". These associations rely on the relational and metaphorical quality of poetic forms to make such unrelated ideas come together to evoke meaning. Bahktin argued genre calls upon both the performer and the reader's cultural knowledge summed up by the accumulated memories of numerous stories told before (1997).

The tendency of genre to differentiate, frame, and represent cultural regimes make it an ideal means to define the cultural groups in this thesis. Since the documents in a genre follow the same framing conventions, it implies that these documents are written under distinctive cultural norms and expectations. Therefore, organizing the documents by the conventions they adhere to reveals the difference between cultural narratives. This separates groups and permits a space to analyze how these groups and narratives interact. Much changed while these documents were written, including amendments to laws and the advancement of mining technology. While these changes have significantly defined and redefined their respective social organizations' positions concerning resource management and extraction, the conventions of the various genres in which they are expressed have remained relatively stable. Table 3.1. is a list of textual evidence analyzed

in this thesis. The texts are a partial representation of the active social organizations interested in natural resource management or REM seabed extraction and were selected based on access and the primacy of the social organization on the topic. For the purposes of the thesis, genre analysis provides material evidence that the cultural regimes interested in natural resource use and seabed mining in particular are different. Moreover, the difference in conceptualization, in value, and in use these resources is a fundamental conflict that problematizes seabed extraction in Tahiti.

Table 3.1. Objects of Analysis

| Title | Genre | Author |
|---|---------------|--|
| Les ressources minérales et énergétique du futur sont au fond des mers | Press Release | Pierre Cochonat |
| Exploitation minière en eaux profondes: la précaution est recommandée | Press Release | Jean Viatage |
| Les ressources minérales du future sont-elles au fond des mers? | Press Release | Yves Fouquet |
| The Impact of Seabed Mining | Report | Jack Barkenbus |
| A Concept for Seabed Rare Earth Mining in the Eastern South Pacific | Report | M. Bashir, SH. Kim, E. Kiosidou, H. Wolgamot, W. Zhang |
| UNCLOS: Agreement relating to the implementation of Part XI of the convention | Legislation | UNCLOS |
| Proposition de Loi Organique | Legislature | French Senate |

Law

Law has a particularly strictly regulated set of conventions due to its normative power over a population. As a genre, law is often characterized by terms of art and various degrees of ambiguity of interpretations. Consider Ruth Breeze’s analysis of “lexical bundles”, or frequently recurring sequences of words irrespective of the nature of any links between them in legal genres (Breeze, 2013). In particular, Breeze’s analysis of lexical bundles in legislation indexed four sets of intangible framing attributes, “in the case of”, “in accordance with the”, “is liable on summary”, and “for the purpose of”.

These bundles alluded to and often stood in the place of “if...then” clauses, the fundamental logical theorem upon which most Western law is based upon (2013). Legal discourse, especially law is concerned with the conditions from which conclusions must necessarily follow because overarching statutes assume this chain of causation will be stable across most cases that it will be applied to regulate and adjudicate. Legal discourse may be more conscious of its conventions and frames as they are formulaic strategies for limiting or extending interpretation. As such, lawyers and lawmakers are particularly sensitive to the intertextuality in legal documents (from which legal documents legitimize their authority) and the scope of give within lexical markers that is specific to the contextualization of documents within this genre.

This thesis concerns itself with two pieces of complimentary legislature that bear upon seabed mining. The United Nations Convention of Law of the Sea (UNCLOS), is an international treaty that officially regulated the waters, seabed, and resources outside of any national jurisdiction (the High Seas) that was ratified on December 10, 1982. The treaty established limits to the EEZ of nation states, thus identifying the area under the jurisdiction of the convention before enumerating the duties and regulations of ratifying states. Part XI, Section 3, and Article 150 is framing article which overviews the duties actors must fulfill when developing the Area (UNCLOS, 1982). This article demonstrates many of the genre markers that make up the conventions specific to legislature. For one, Article 150 indexes many interests that actors must keep in mind. In order to organize these interests, the article is formatted with an internal structure of bullet points. This compositional marker parallels the aim of the article to orderly charge actors with responsibility by systematically separating each clause with a point. Another generic characteristic of the article is the use of third person narration. The use of the omniscient third person perspective underscores the legislature’s position as an uninvolved entity

that objectively resolves the interests of all concerned actors and maintains international peace. Lastly, the article demonstrates thematic genre markers such as a specialized lexicon of loaded terms of art. This is evidenced by terms such as “shall”, “Enterprise”, “the Area”, and “States”, all of which have particularized legal definitions and interpretations beyond its general meaning and use.

The second piece of legislature is federal in authority and asserts jurisdiction over the land, water, and resources of within the state’s EEZ. Organic Law is a foundational body of law from which governments draw authority for law making and sovereignty. In the French political system, *Loi Organique* is a particular set of statutes that leans on the authority of the French Constitution and hence commands constitutional power. In Title III, Chapter 1, Section 5, Article 47 of the *Loi Organique*, French Polynesia received complete control and authority over “les rivages de la mer, y compris les lais et relais de la mer, le sol et le sous-sol des eaux intérieures, en particulier les rades et les lagons, ainsi que le sol et le sous-sol des eaux territoriales” (*Loi Organique*, 2004). Perhaps an important convention in French legislation and of special political importance in French Polynesia is the use of French in legal documents. Though French Polynesia is quasi-autonomous and Tahitian is now taught in schools, French remains the dominant language of the government and legislature. The legal system in French Polynesia is still largely modeled on the conventions of the French system, though some vestiges of communal and familial land tenure systems and traditional natural resource management practices are casually implemented on some islands (see D’Arcy, 1978; Johannes, 1981). In both UNCLOS and *Loi Organique*, legislature pertaining to seabed mining is structured differently. Making these distinctions visible is more than an academic task, but an analysis with real consequences. The normative power of these legislative genre conventions and the interpretation of commands guided by legal frameworks results in

material action that bear upon the facts on the ground: industry practices, standing, liability, and litigation points.

Reports

Reports comprise a vast genre, with conventions that vary depending upon who writes the report and who is evaluating. The field of action for reports can likewise vary, but as a general rule, they are concerned with informing the reader about the relevant variables, conditions, outcomes, gaps, and predictions pertaining to a complex situation. Reports are powerful discursive texts that can influence whether or not an industry invests or determine what interests get funded and further researched. Reports are carefully managed by their writers to present the information as appealingly as possible. Therefore, their scripted and tactically obscuring and illuminating wordage is implemented to maximize the useful, appealing aspects of the content, while minimizing the content that is less so. For example, one thematic marker within the report genre is the reliance upon a positive lexicon. Brian Rutherford's analysis of corporate annual reports demonstrated this convention as a means of 'impression management', specifically in financial performance (impression management being a significant field of action within the report genre). In Rutherford's analysis, the annual reports featured a lexicon dominated by economic terminology, such as "profit", "rate", "sales", and "market", demonstrating a clear emphasis upon finances as a measure of success, a correlation that was most markedly stronger in companies that suffered decreases or had relatively lower profits (Rutherford, 2005).

"The Impact of Seabed Mining" also relies on the natural and rational authority of economic and scientific support. Chapter three of *The Impact of Seabed Mining* begins with: "When the technical feasibility of mining manganese nodules first became

generally recognized, the prospect for commercial exploitation was viewed with considerable excitement. The possibility of tapping this abundant ocean resource raised expectation in some quarters that the entire international community could immediately reap the benefits” (Barkenbus, 1979). In stating relevant economic, scientific, legal, and scientific facts surrounding seabed mining, the authors work within the conventions of the report genre. For example, the report asserts scientific authority and creates credibility with the audience by avoiding intentional markers such as deictic linguistic structures that mark possession, contraction, and subjectivity. In fact, in the reports use of the objectifying, omniscient third person perspective, the report naturalizes the cultural beliefs of economic rationality. The language of rationality serves the field of action of the report genre by presuming that with technological advance, exploitation, progress, and modernization must necessarily follow. As a genre, the report frames information through a lens of rationality, objectivity, and science, thereby lending a tone of persuasive pragmatism to the text and argument.

Press Releases

Although press releases have diversified beyond print material to digital outlets, they continue to show regularity in terms of format and structure, including information-oriented, evaluative, and impression management moves (Johnson and Haythornthwaite, 1989). Despite many conventional similarities between press releases and reports, press releases are generally more colloquial and widely circulated within the public than reports that are generally produced by experts and for experts. Press releases are now part of standard business practices of many governmental agencies, NGOs, and companies.

Two press releases are analyzed in this thesis. In 2011, the Institut Français de Recherche pour l’Exploitation de la Mer, Ifremer, released an online publication

entitled: “*Les ressources minérales et énergétiques du future sont au fond des mers*”. The structure of this press release follows the evaluative, information-orientated and impression management moves Johnson and Haythornhwaite indexed as typical of the press release genre. The publication begins by asserting legitimizing the authority of the institute’s claims by indexing scientific and technological bases that are alluded to throughout the piece.

Toutes les analyses montrent que les états européens sont confrontés à une mutation des marches mondiales de matières premières. □□ Avec l’envolée du cours des métaux ces dernières années, les états dépendent déjà fortement d’importations de minéraux métalliques et de métaux dits de haute technologie tels que le cobalt, le platine, les terres rares, et le titane. (Cochonat, 2011).

This is followed by informative and evaluative content concerning recent legal actions to open the field to seabed mining, economic feasibility and benefits, state interests and scientific research, and announced the launch of a new multilateral commission, Horizon 2030, charged with identifying the future benefits of the resources of the seabed and forging cooperation between private and public actors to encourage further seabed development (2011). The publication concluded with a list of priorities future commission actions will be based upon, demonstrating the informative and assured characteristics of the press release genre.

Similarly, Mediachimie, an organization of French chemists published a press release entitled, “*Les ressources minérales du future sont-elles au fond des mers?*” (Fouquet, 2011). This longer press release includes tables, charts, statistics, maps, and images which depict the kinds and amounts of minerals available for extraction from French Polynesia’s EEZ and the South Pacific. The publication is highly informative but maintains a position in favor of seabed exploitation which is supported by evidence in the

data tables and maps in particular that the minerals are abundant, the profit and potential to be gained from the venture is economically beneficially, promote international cooperation, and has minimal impact on the benthic environment. It offered assurance that seabed mining would be, “un enjeu majeur si l’Europe veut conserver sa position de premier plan mondial au niveau scientifique et technologique, et se positionner sur les enjeux économiques nouveaux que constituent les ressources potentielles des grands fonds océaniques” (2011). Again, informational, evaluative, and impression maintenance conventions are regularly employed in order to promote public interest and support of seabed mining in the South Pacific and in French Polynesia as an economically feasible, safe, and beneficial affair.

The differences between these cultural regimes are evidently more than literary. These examples of discourse demonstrate that cultural groups frame differently from each other. Each genre framework maintains itself and permits a measure of flexibility and creativity within its conventions in order to balance credibility drawn from culturally salient authorities such as scientific research or constitutional law with horizontal and current contexts. Resource extraction, seabed mining in particular, is the object of interest in common between these examples of discourse. Even before analyzing the metaphorical differences in conceptualizations of resource management and seabed mining, it is evident that these cultural regimes are not equivalent.

Metaphorical Theory

Thematic markers, as defined by Coutinho and Miranda in “To Describe Genres: Problems and Strategies,” are lexical choices specific (though not necessarily exclusive) to the discursive genre (Coutinho & Miranda, 2009). For example, consider the terms of art in laws, such as UNCLOS. These are terms with particularized legal meaning. For

example, In UNCLOS “the Area” refers to the land outside the jurisdiction of any nation-state, and the latter refers to the principle that a resource belongs to all of humanity and posterity. The specialized interpretations associated with legal terms of art such as “Area”, delineate a contour of genre framework through which information is contextualized. These interpretations are metaphorical and comprise a figure of speech or a comparative relationship between concepts. Some metaphors are used across cultural regimes. For example, within the same statute, the drafters used the phrase “carried out”, a phrase with understandable meaning in many cultures besides the legal community. Not only are the relationships between these concepts ambiguous and socially created, they are potent structures that influence the ways speakers construe and define their experience. Across all of the texts analyzed in this thesis, metaphor plays an essential role in conducting thoughts, attitudes, values, and opinions surrounding seabed mining. Regardless of whether the author of the texts was in favor or against REM extraction from the seafloor, metaphor was an essential and powerful rhetorical tool.

Metaphor is often thought of as ornamental or decorative. A staple in the discursive diet, metaphors are quotidian but explained, disassembled, and studied to various results. However, this thesis begins a metaphorical analysis of its texts with Lakoff and Johnson’s 1980 book, *Metaphors We Live By*. Lakoff and Johnson argued that metaphors constitute a large part of the way humans think and act. They stated, “our concepts structure what we perceive...[then] our conceptual system plays a central role in defining our everyday realities...[and since] our conceptual system is largely metaphorical, then the way we think, what we experience, and what we do every day is very much a matter of metaphor” (Lakoff & Johnson, 1980). In short, metaphors are the principal way that humans interpret and relate to experiences, because they provide meaningful frames and points of reference for meaning. Through metaphors, speakers are

able to control the relationships that the audience crafts between two concepts, thus mediating the audience's perception. Firstly, objects and events are arbitrarily symbolized in language through words and syntax, thus constructing discrete, standardized, and internal representations for coordinating and negotiating speech acts. Objects and events are further contextualized through the concepts constructed by metaphorical expressions (1980). Common expressions such as: "You're wasting my time!", "I didn't budget my time well.", or "I lost time stopping at the store", imply culture-specific ideas about the value and nature of time. These cultural ideas are perpetuated and adhered to each time a phrase like this is uttered. In this case, English speakers are pointed to the subtle inference that time is a valuable commodity (1980). By no stretch of the imagination is it difficult to see how the idea of time as a valuable commodity influences the way Americans conduct themselves in real life. Furthermore, that Americans experience time as a valuable commodity the relevance of such metaphorical expressions as "You're wasting my time!". Therefore, metaphorical expressions not only draw their strength and meaning from cultural ideas and values, they are also perpetuations of the cultural ideas from which they come (1980). It stands that linguistic abstract concepts become more easily relatable and malleable in the mind and pervasive throughout a speech community.

Some metaphorical language is not always as easily spotted. Typically, Western literature represents the standard metaphorical form as the relationship A is B. However, metaphorical language is often more complex than this relationship suggests. Some of the most influential on cultural perceptions are much more subtle and discreet. Raymond Gibbs Jr. provides a useful example in his article, "Researching metaphor" of the subtlety and influence metaphorical language has upon conceptualization. Polysemy, when a lexeme has multiple meanings is sometimes made sense of through our understanding of

an initial concept (Gibbs, 1999). Gibbs points to the many meanings to the word stand by comparing its usage in a sequence of sentences:

We stand to sing the national anthem.

Ray stands 6'5" tall.

The clock stands on the mantel.

I can't stand the job I have.

The part stands for the whole.

The law still stands.

In this case, the A is B rule does not fit, yet stand is still a metaphor and in fact, instrumental in our understanding of the sentences (1999). Given the vast number of forms and maps of relationships that illustrate the mechanics within metaphors and their contexts which make them function and their application, metaphors are neither easily nor comprehensively studied. That being said, the following identification of frequently occurring, classifiable metaphors is a useful, albeit partial means of observing some underlying attitudes and values surrounding seabed mining. Of special interest is the use of normalized metaphorical language, this being lexicons of metaphors that are so widely used within a speech community that their use is conventional. Such metaphors affect naturalness and rationality, yet are in fact, potent conduits of meaning and comprehension (1999). These stand as evidence of patterned, culture-specific assumptions and attitudes that frame content within a pervasive, meaningful, and natural logic, assuming that cultural regimes use them aim to maintain, reproduce, and legitimize their perspective and further their aims.

In all of the discursive materials analyzed in the thesis, metaphorical language is used to highlight and obscure different features of seabed mining. Though the metaphorical structures and categories vary between the social organizations and are used

to their respective ends, the culturally constructed and as utile nature of metaphors and their uses signal important conceptions of seabed mining and resource management.

I began the metaphorical analysis with open coding, an initial indexing and organization of relevant anthropological data from my selected textual documents. Textual documents are laden with genre conventions, grammatical choices, and poetics, too many to all be applicable or within the scope of the thesis to consider. In order to begin processing, indexing evidence, and theorizing patterns, the open coding produces created analytical units. In order to isolate local and overarching metaphorical structures within the documents, the criterion was left intentionally broad. I indexed metaphors about the nature of natural resources or human interaction with nature across all of the documents. This coding scheme included any metaphors that indicated or implied ideas about what constituted a natural feature, what they are or are like, how they act or are acted upon, how humans are assumed, positioned, or portrayed in relation to these features or if at all. This resulted in an initial, rough rendering of analytical units that could be compared and contrasted (see Appendix).

“The Impact of Seabed Mining”

In “The Impact of Seabed Mining,” Barkenbus and other authors writing under a Western, globalized corporate cultural regime does not deal directly with the materials. Rather, global capitalists manage the money that represents the value of the natural resources. However, dealing with REM mining in the seabed presents a risky venture because markets for these resources fluctuates, technology is only recently developed, and there is little legal precedence that clearly articulates actor duties. Hence, Barkenbus frequently employed positive gambling metaphors into his report. Corporations and investors are familiar with the risks of enterprise, so encouraging further research and

exploration of the seabed turns on an enunciation of its advantages and benefits.

Barkenbus described a previous, unsuccessful venture into seabed mining, writing, “The struggle of miners to win exceedingly small concentrations of the desired minerals from the foundation in which they are embedded is certainly not elegant” (Barkenbus,1979).

This was to say that the endeavor was neither simple nor easily done; finding the REM economically worth extracting and separating and refining the minerals is a technologically and scientifically fraught task. Winning, connotes a sort of contest, and it appears that in that case, success was slow to come and produced a minimal yield for the input of work and effort. Nevertheless, the struggle to win is an admirable fight, and positions the action and its outcome in a positive light.

Barkenbus continued his use of gambling metaphors to refer to expected benefits and competition between corporations, “...the creation of an international organization to manage and regulate activities on the deep ocean seabed would be facilitated immensely by the rather meager resource pot that has now been allotted to the international community” (Barkenbus, 1979). In gambling terminology, the pot, or jackpot, refers to the sum of money participating players buy into and is won by a player with the winning hand. Barkenbus used this metaphor to describe the potential wealth accumulated through the REM seabed mining. Whereas gambling games such as poker require a high hand played right against other players, seabed mining too requires a combination of initiative, initial capital, ingenuity, and luck.

Barkenbus furthered his comparison between REM seabed mining and gambling, writing, “...the distribution of vast ocean wealth was not at stake” (1979). Firstly, the phrase, “ocean wealth” is a particularly telling term. The ocean wealth Barkenbus referred to was not merely the REM to be found on the seabed, but also the accumulation of capital therein. Evidently, resources are resourceful to Barkenbus not in their natural,

use value, but in their exchange value. Barkenbus is not concerned with the use value, and indeed, the use value of these materials is only briefly mentioned in the beginning of the document to indicate their use in permanent magnets, lasers, and other kinds of nanotechnology. Barkenbus is interested in what and how much capital a corporate actor can accrue in exchange for REM. Following from this distinction, the gambling metaphor Barkenbus then employed was “stakes”, stakes meaning amount a player bets when taking a gamble, or what a player has to lose by buying in. Immediately, the connection between the money a player bets to enter the gamble initial capital investors must put forward in order to develop the technology, execute the mining, and transport and refine the raw materials becomes evident. When one gambles, the one does not know the hands of the other players, nor does one know the next card that will be drawn. In short, it is a gamble of probabilistic outcomes. Similarly, despite the lack of certainty, history, and stability in REM, the initial capital that a corporate actor must put forward is its stakes in the endeavor. Once they have invested, they have capital to lose and a significant interest to not only break-even, but then some. Barkenbus indicated similarities between gambling and prospecting in seabed mining to describe the nature of the relationship corporate actors would be entering by investing in seabed mining. Metaphorical concepts such as “winning”, “pot”, and “stake” are helpful ways for business- and economic-minded people to keep track of the costs, benefits, and risks throughout the document.

Lastly, a gambling metaphor, though thematically different than the previous examples, Barkenbus employed was agriculture. As with a gamble made around a poker table, farmers also take great financial risks, investing resources in seed, fertilizer, pesticide, equipment, and labor without a guarantee of a good crop. Besides this initial similarity, Barkenbus also likened seabed mining to agricultural practices. Barkenbus and other reports on seabed mining have described seabed mining as essentially

vacuuming up topsoil from the benthic layer and gathering the valuable nodules. Barkenbus likened this process to agricultural practices, insisting, "The possibility of tapping this abundant ocean resource raised expectations in some quarters" (1979). The tapping Barkenbus alluded to a particular harvesting method used to extract viscous materials such as tree resin or rubber. In this sense, the tapping agricultural metaphor plays upon the liquid quality of the ocean and its resources in a familiar way. He then continued, "...that the entire international community could immediately reap the benefits" (1979). To reap, in an agricultural context is to harvest the fruit that has been produced by labor. In the case of seabed mining, Barkenbus meant that the international community could profit from the development of the seabed. Thus, the metaphor emphasized the author's assertion that some actors believed seabed mining would be a significantly profitable, if not risky venture for the international community. Hence, the author alleviated some of the tension and anxiety about economic risk by illustrating through productive agricultural metaphors.

"A Concept for Seabed Rare Earth Mining in the Eastern Pacific"

Likewise, agricultural metaphors indicating abundance and yield are employed in the report, "A concept for seabed rare earth mining in the Eastern South Pacific" by Bashir et al. For example, Bashir et. al. stated, "Hydrothermal vents occur in fields, that is, clusters of vent chimneys within an area of a few hundred square meters. The spreading rate of mid-ocean ridges determines the space between the vent fields" (Bashir et. al., 2012). In this case, the parallels between the risks, processes, and benefits associated with agricultural work bridges over the liminality and unknown associated with seabed mining, creating a sense of viability and familiarity with this new endeavor. The use of "fields" has connotations with harvest and expanse, both important ideas to

communicate to potential, risk-averse investors. The use of this particular type of metaphors in the seabed mining reports constructs a sense of predictability and control over variables. Agriculture is a well researched and has a long tradition in Western society. It is often associated with civilization, economy, and an archetype of humankind's relationship with the environment. As an industry, agricultural generally includes a measure of initial risk: a farmer does not know what his yield will be in a given year, as this depends on a host of variables such as drought or crop disease. A farmer must risk an economic loss by sowing an amount of a given crop and work to produce a yield that compensates the initial investment. Likewise, parties interested in investing or participating in REM extraction requires a similar risk with predictable outcomes. The report's locus is the risk minimization and management of foreseeable outcomes. Though technology that makes extraction economically feasible is available, it is not a sure prospect. The profit depends on many external factors, such as whether or not the REMs are in amounts large enough to be viable or fluctuations in the market for these minerals. Employing agricultural metaphors makes the specialized language, regulations, and processes surrounding seabed mining seem more like this farming process. The benefits from the former make the benefits of the latter seem more concrete, long-term, and valuable. The agricultural metaphors represent a familiar relationship between humanity and the environment, namely control over the earth and its natural resources.

Secondly, "A Concept for Seabed Rare Earth Mining" was also concerned with the gamble that investors took in funding seabed mining. Bashir referred to people with time, resource, and emotional investment in seabed mining and its repercussions as "stakeholders". The authors stated, "This involves helping local communities understand the company's plans, and hopefully gaining community acceptance. To engage local

stakeholders, Nautilus visited many local communities around the mining area and gave them information about the project, while scientific stakeholders were engaged by holding international workshops with world experts in related scientific fields” (2012). “Stakeholders” refers to scientists who have invested much research into seabed mining and its effects on the environment and human health and local citizens who have built a life in or near the area of interest to seabed mining companies. However, in a game of chance, a stakeholder also referred to a player with a wager. In both the report and the gambling contexts, stakeholders have a portion of their resources tied to a probabilistic outcome of an event and are vulnerable to the outcome. However, there are two important points where the metaphor slips. One, in a gambling context, it is most likely that a player uses liquid assets to buy into a round. Meanwhile, the report mentions stakeholders with investments of various kinds. Most importantly, these investments extend beyond the quantifiable, such as capital investment, but to emotional investment or historical and cultural attachment. By using the stakeholder metaphor, the audience understands loss and costs aside from financial risk. Drawing connections between financial, emotional, and cultural stakes gives traction to concepts that are difficult to quantify in a market value, but are nonetheless relevant to the enterprise. Secondly, there is a notable difference between a deck of cards and the context in which mining corporations operate. In a card game, all players are bound to play the same rules. A player wins through luck of the draw or cleverly playing upon the probabilities he or she ascertains by observation. A player that breaks the rules is cheating and is playing outside the game. However, rules controlling the actions of corporations are less concrete and are not so clearly agreed upon. The many layers of bureaucracy, the gap between on the ground reality and corporate leaders is vast, and the multiple, dynamic factors such as global market for REM and geophysical processes and creates more inputs for manipulation, chance, and

error. The authors of “A Concept for Seabed Mining” used the Stakeholder metaphor to communicate risk.

“Les ressources minérales du future sont-elles au fond des mers?”

Agricultural metaphors were also found in press releases about seabed mining. Yves Fouquet’s Infremer press release, “*Les ressources minérales du future sont-elles au fond des mers?*” relied on agricultural metaphors throughout his press release about France’s future interest and development of seabed mining. “Les premiers nodules polymétalliques furent récoltés par faible profondeur dans la mer de Kara en 1868,” he stated. *Récolté* is a French participle meaning “harvested” (Fouquet, 2009). Here, Fouquet used the harvesting image as a way to conceptualize the seabed mining processes in a familiar way. The notion of harvesting is approximate, but suggests an action which, in an agricultural context, is cyclical, positive, and well-understood. Planting and harvesting is cyclical because a farmer will plant, add nutrients and pesticides to help the crop grow, then reap the valuable parts, and then let the soil farrow before planting again. Meanwhile, mining is also an extractive process in which valuable parts are separated and taken. However, the metaphor breaks down in finer comparison, because unlike modern agriculture, mining is a process in which naturally occurring, raw materials are extracted but nothing is put back in its place to ensure another yield at a later date. Instead, the area and ‘waste’ extracted with the valuable materials are haphazardly replaced. Regardless of the point of separation between the parallels of agriculture and mining, imagining seabed mining as virtually tantamount to a harvest, the harvesting metaphor produces an almost subliminal understanding favoring seabed mining. The press release largely demurred on the subjects of potential harm to benthic

environments or the disadvantage it could pose to developing governments and economies, but rather emphasized the economic fruits, if one will allow, ripe for picking.

Fouquet continued the agricultural metaphor by stating, “Les nodules polymétalliques sont constitués de couches concentriques correspondant à des phases de croissance successives autour d’un noyau central” (2009). Again, the technological, chemical, and biological processes and mechanisms are complex and technical, and while investors and other interested parties are interested in the workings of seabed extraction, the vernacular and expertise often requires translation into more general terms. Thinking of the nodules as harvested materials as opposed to mined connotes a different sense of extraction. Mining is a heavily contentious terms, especially given the history of mineral extraction and its heavy toll on human health, environmental degradation, and limited economic sustainability. Agricultural harvesting, however, seems much more innocuous, as farmers continue to work fields year after year and continue to produce large yields. Hence, similarly to the function of agricultural metaphors in the reports, the usage of familiar agricultural terms allowed a simplified understanding of the complexities surrounding seabed mining and how these processes included risks and yield benefits in a fashion similar to those in the agricultural industry.

Fouquet did not limit himself to agricultural metaphors. In fact, the name of Ifremer’s 5 year objective, l’Horizon 2030, contained an important orienting metaphor. As a rhetorical device, the names of organizational prospectuses such as these are heuristics for the general mission and values of the group’s undertaking. The actions of the organization both shapes and is guided by the name. In this case, l’Horizon 2030 is Infremer’s prospective on developing and exploring alternative energy solutions from the ocean. In the president-director, Jean-Yves Perrot’s “*Les énergies renouvelables*

marines : Synthèse d'une étude prospective à l'horizon 2030," he explained the summarized the actions and goals of l'Horizon 2030 as,

La diversification énergétique, de l'engagement européen dans la lutte contre l'effet de serre, des impacts environnementaux des aménagements en mer, ainsi que de la valorisation des zones côtières, siège d'une diversité d'usages en interactions et en concurrence. Compte tenu de l'effort nécessaire sur les énergies renouvelables, les marges de manœuvre relatives au développement des énergies renouvelables marines doivent être identifiées en fonction de leurs coûts estimés, des contraintes technologiques et d'aménagement à terre comme en mer, ou encore des impacts environnementaux potentiels (Perrot, 2008).

To these ends, "horizon" is a metaphor for the future benefits that will come through productive and forward-moving decision-making and organizational actions. "Horizon" has multiple definitions, yet two important meanings are particularly relevant to understand the metaphorical construction in the Cochonat's press release. First, horizon is the line that appears to separate the earth and the sky. This has important, intertwining nautical and astronomical significance, as sailors and wayfinders used the horizon as an aid for navigational reckoning. Looking towards the horizon informed voyagers of the inevitable and what lay ahead, be that a new bearing, a land spotting, danger, or weather patterns. From this perspective, titling Inframer's mission statement l'Horizon 2030 has a similar effect. The actions and value statements support greater economic benefits and energy efficiency that come with investment in the development and exploration of cutting edge, oceanic energy sources and natural resources. As a metaphor, "horizon" operated in this context as the summary *telos* for the mission. Secondly and closely related, is the connotation of horizon with the limit on the range of one's knowledge and understanding. Extracting resources such as REM and alternative energy sources requires

a store of information about the convoluted inner workings of the environment and an innovative spirit to balance desirability with technological and economic feasibility. This implied that while the image of horizon successfully makes a connection between the future goals of Ifremer and the bearings and forecasting in the future, the horizon also represents a limit to be surpassed and expanded in terms of intellectual understanding.

“Les ressources minérales et énergétiques du future sont au fond des mers”

Another Ifremer press release, “Les ressources minérales et énergétiques du future sont au fond des mers”, by Pierre Cochonat used agricultural metaphors to emphasize the spatial dimension of seabed mining and REM. Through these metaphors, Cochonat demarcated spatial limits on the uses and consequences flowing from seabed mining. He stated, “Cela [REM mining] ouvre un champ nouveau pour l’exploration et l’exploitation future, parfois déjà engagées, des ressources minérales marines profondes” (Cochonat, 2011). Similar to the reference by Bashir et. al. to hydrothermal vent “fields”, Cochonat uses the French term, “champs”, which can refer to both an agricultural field. In both cases, “field” alternately creates a spatial metaphor which effectively created, as Ilana Friedrich Silber concluded in her article, “Space, Fields, Boundaries: the Rise of Spatial Metaphors in Contemporary Sociological Theory”, the ability to capture the relationship of both unity and fragmentation and order and disorder (Silber, 1995). Put simply, Silber refers to the ability for spatial metaphors to articulate a cohesive group and distinguish them from each other. In this case, the use of “field” pictured the surface area covered by hydrothermal vents and REM as coherent and separate from that of the surrounding area. The agricultural metaphor links the conception of seabed fields with agricultural fields, tracts of land dedicated to various agricultural crops as opposed to land parcels used for other means. Distinguishing land and its resources as distinct spaces

implied that a phenomenon can exist within the borders of the field or without. While this distinction can appear trite, it is a subtle construction that emphasizes a sense of in/out and inclusive/exclusive. Such divisions are crucial preemptory constructions for indicating and mapping out control over the resources and the area. The metaphor is a useful though artificial construction that serves as the base for claims of sovereignty, ownership, entitlement, and reimbursement, all ideas of interest to the businesses and state actors involved with seabed mining. The metaphor imposed a notion of inclusion and exclusion, effectively identifying things and locations of interest and confining them for use in the problematic and useful sense of situation and orientation in a complex reality. The sense of place makes it possible or easier to articulate the abstract position one identifies with as opposed to others or articulates relationship one has with his or her context.

In a second press release authored by Cochonat, spatial metaphors set a specific agenda for conceptions of natural resources and natural resource management, especially concerning mineral extraction. In the press release, Cochonat positions the reader in line with his argument for the exploration and exploitation of REM using spatial metaphorical language. He stated,

Aussi, en plus de la recherché de nouveaux gisements terrestres, l'humanité devra de plus en plus se tourner vers la mer pour répondrai à la demande mondiale en énergie et matières premières. En dehors des hydrocarbures déjà exploites et ayant leurs propre enjeux de développement, des perspectives se présentent sur des ressources énergétiques et minérales potentielles : hydrates de méthane, hydrogènes naturels, sulfures hydrothermaux, nodules et encroutements de manganèse. (Cochonat, 2011)

Through the phrase, “se tourner vers”, Cochonot positions the audience on a plane with seabed mining and other energy alternatives and natural resource markets. Movement from one point on this plane to another is through a linear movement. The orientation of the person moving along a ray beginning at the origin is the direction of his or her trajectory. This movement is distinct from the trajectories a person would have if he or she were moving to a different point. In this case, this movement between points is related to a shift in consideration between marketable raw materials. From this perspective, seabed resources are characterized by the market value the various refinements of their raw forms result in. Moreover, they have an economic pull that diverts investment capital attention from one venture to another. “Se tourner vers” directs the helps the audience track the shift in perspective to a new one. The new position/perspective is that humanity should choose to develop alternative energy sources and raw materials. The spatial metaphor likens the movement from one position in space to another to an ideological shift from fossil fuel use to new, alternative energy sources. Furthermore, the turning metaphor implies that the audience had previous been facing elsewhere (aligning their attitudes and expectations with a different position), thus creating tension between a previous paradigm and an alternative one and affirming a theoretical shift. Consider the spatial metaphor Cochonot employed to further persuade readers : “Les états européens vont donc devoir faire face à un besoin d’améliorer les connaissances des gisements sous-marins afin d’en approfondir le potentiel” (2011). Here, the difference between groups as demarcated through different positions both creates solidarity and a hard line perspective on seabed mining development. The facing metaphor creates a unifying goal and relationship between the European States (an important distinction in and of itself) by positioning them in a united and confrontational attitude of seabed mining development. The spatial metaphorical language gainfully

positions the audience from the spatial/theoretical perspective of the author and tracks his and the author's shift in standpoint and attention.

Another compelling metaphor mentioned by Infremer in "Les ressources minérales et énergétiques du future sont au fond des mers" was the l'Horizon 2030 initiative. L'Horizon 2030 is a comprehensive legal, economic, scientific, and technological plan that advances seabed mining interests and prospects. As in the previous press release document, the name of the initiative capitalizes upon the horizontal timeline and use of space markers to define temporal events. In a complimentary press release, the President and Director of Infremer, Jean-Yves Perrot, described l'Horizon 2030, saying,

C'est dans ce contexte que j'ai décidé de lancer, en septembre 2009, un travail de réflexion prospective dans ce domaine à l'horizon 2030 en centrant la réflexion sur les besoins de la France et de l'Europe. Disposant d'un vaste territoire océanique, de moyens technologiques et de compétences reconnues depuis longtemps dans l'étude des grands fonds marins, la France se doit en effet de rester un acteur majeur de cette exploration, a fortiori au moment où se dessinent les conditions de mise en œuvre d'une valorisation industrielle. (Perrot, 2008)

In part, the effectiveness of the metaphor comes with the connotation of horizon with navigation and reckoning. Scanning the horizon for clues about upcoming weather systems, obstacles, changes in conditions, and astronomical reckoning tools, provides orientation and guidance. While seabed mining is technologically feasible, the environmental, political, and economic effects flowing from natural resource extraction in the seabed are still largely unknown. "Horizon" provides a sense of orientation, in this case, in terms of time. The connection implied that as time passes and 2030 approaches, more information will become available. Therefore, actors will first, have a trajectory to

work towards in the present moment in the form of a sense of purpose through which the actions of the organizations can be conducted and rationalized. Secondly, in the future, seabed mining will become increasingly predictable and controllable and people will become desensitized to the strangeness such a risk poses. The forward looking orientation of l’Horizon 2030 is concerned with “expanding horizons”, broadening the intellectual scope of evidence and information while united towards a common goal. Moreover, using “l’Horizon” in the context of an island nation, “l’Horizon” connotes the connection between the horizon and the ocean. Thematically compatible, it highlights the nautical aspect of seabed mining. Historically, for both Western and Tahitian sailors, the sky and celestial bodies have been important navigational devices on the open ocean. Tracking the ocean as a key characteristic of seabed mining, then, is a sort of play of semantics, connecting Western cultures with Oceanic ones.

“Exploitation minière en eaux profondes: la précaution est recommandée”

In, *“Exploitation minière en eaux profondes: la précaution est recommandée”* an online news article on TahtitInfo, a trending website on Tahitian and Oceanic interests, journalists used metaphor to frame their perspective on seabed mining. Firstly, the author varied his reference to mining activities in the South Pacific seabed. In French, extraction is referred to as “exploitation”. However, the term “exploitation” has other compounding definitions and contexts, including to use and benefit at the expense of another. In fact, the phrase that Viatage used most often was “exploration minière” (Viatage, 2011). There are important connections the author made between exploration and “exploitation” of seabed minerals. Exploration is a venture from the known into the unknown. Similarly, seabed mining includes technological advancements designed to cope with dynamic ecosystems and geophysical systems that are still poorly understood and economic

investments that with uncertain far-reaching aspects. However, an important point of divergence is a nuanced one: exploration has positivist, capitalist connotations that shed favorable light on seabed mining. Exploration is a historically key objective of colonial states looking to expand their religions and economic and political influence. From this perspective, mineral exploration presents an adventurous opportunity to increase capital. Furthermore, exploration is mute in terms of invasiveness. The exploration rationale emphasizes the benefits to the explorers in order to attract investors. Exploration does not necessarily take into account the perspective of people, places, and things that are being explored. This tacit stance positions the minerals, environment, and effected people in the passive, implying that exploration is not as intrusive or disturbing as exploitation, where one takes and does not adequately compensate for what he or she took.

Also, Viatge used spatial metaphors to polarize groups. As illustrated by the previously analyzed examples, spatial metaphors such as “horizon” and “field” organize phenomena in terms of inside/outside and towards/away. Likewise, construing time as space creates an organization of beginning/ending that constitute a shared and imaginary time sequence through which the author and the audience move. Spatio-temporal metaphors create frontiers and domains of time reflected in verb tense, lexical selection, and sentence structure. Viatge began the article saying, “Les recherches concernant les minéraux en eau profonde et leur possible exploitation *dans* le future, offre un potentiel économique *émergeant* pour les états du Pacifique” (2011) emphasis added. In this sentence, the author used the present and present progressive tenses (e.g. “concernant”, “offre”, and “émergeant”) to place the time/space location of the author and the audience in the present. French constructs time as a ray emanating from a point that is the origin of time and ongoing from there ad infinitum. On this plane, place in time becomes visible as a point in space. Therefore, a point in time would be located relative to where other

phenomena or points on this linear continuum a phenomena exist. Time becomes more definitive when conceptualized parallel to a spatial plane and orients people in a similar way, past/future and back/front respectively. From here, events and objects existing in the past and ended in the past are primary and occur to the left of the present point and closer to the beginning of time. Meanwhile, points in the future are points along the number line occurring before the present point. In this metaphor, as one moves from point to point on the arrow of time, one must inhabit the points earlier in time (closer to the origin point) before arriving at a point later on the timeline (farther from the origin point). From Viatage's vantage point in this particular excerpt, the present is a point where economic potential emerges for Pacific states. Contrastingly, the future is an unplotted expanse farther along the time line. Regardless, a point on this timeline becomes a place not only plottable but inhabitable. The spatiotemporal conception of time orients the self in time through an analogous orientation in space. This notion is highlighted by the preposition "dans" in relation to the future. "Dans" means within or inside, as opposed to other French prepositions denoting spatiotemporal orientation, such as "en" a more general term which can allude to the length of time a phenomena takes. Both, however, are most often translated to "in" in English a preposition used to indicate both spatial and temporal orientation. In Viatage's article, the tense structure of the sentence creates a sort of spatiotemporal determinism where the benefits of seabed minerals necessarily follow the exploitation. In fact, the potential for these benefits is occurring now. Seabed is the future, a positive advancement that is expected and normal along a linear plane as opposed to a regression in technology and economic growth that is implied by moving backwards. Moreover, the forward movement of the author and the audience through time/space towards possible exploitation and the economic potential in REM mining

creates a sense of progression paralleling the linear logic the author presents, despite the complex reality surrounding mining.

Loi Organique

In a recent amendment of *Loi Organique*, a series of laws set down in 2004 by the French government outlining French Polynesia autonomy, Article 47 stated,

...Le domaine public maritime de la Polynésie Française comprend, sous réserve des droits de l'Etat et des tiers, les rivages de la mer, y compris les lais et relais de la mer, le sol et le sous-sol des eaux intérieures, en particulier les rades et les lagons, ainsi que le sol et le sous-sol des eaux territoriales. Les dispositions de l'alinéa précédent s'appliquent sous réserve des emprises nécessaires, a la date de publication de la présente loi organique, a l'exercice par l'Etat de ses compétences et tant que cette nécessité sera justifiée. La Polynésie Française réglemente et exerce le droit d'exploration et le droit d'exploitation des ressources naturelles biologiques et non biologiques des eaux intérieures, en particulier les rades et les lagons, du sol, du sous-sol et des eaux sur-jacentes de la mer territoriale et de la zone économique exclusive dans le respect des engagements internationaux. (*Loi Organique*, 2004)

The perquisite metaphor in the legal document was the personification of the state. The complexities of legal personality are thoroughly described elsewhere in academia, but this thesis is concerned with how the personality metaphor functions in the legal context. For the purposes of the thesis, a broad definition of personality will suffice. That being said, personhood is the idea that there is an individual that can engage in acts and be held accountable for them. A person is distinguishable from others so responsibility and duties of individuals, if they differ, are locally applicable. In short,

personality clarifies where one set of rules begins and ends in terms of application. In the legal arena, personality is the amalgamation of an actor's duties, rights, restrictions, and abilities. For example, corporations have legal personality and can engage in acts, such as the ability to enter contracts. Legal personality extends beyond an individual and is also an artificial distinction given to NGOs, corporations, states, and other international bodies. In Article 47, French Polynesia is recognized as a legal personality with reserved rights to the seabed and its resources and the exclusive ability to exercise them. Without the fundamental metaphor of personality, French Polynesia, as a state could not be given authority over the seabed and its resources within their exclusive economic zone without the cohesion personality. French Polynesia, like an individual personality, is an actor charged with a certain range of rights and responsibilities. Likewise, in the event of a bad action, say, a breach of contract, the same corporation can be imputed. Without the delineations of personhood, accountability would be too widely dispersed and a state would have no incentive to manage the seabed responsibly.

UNCLOS

Another legislative piece with metaphors concerning management of activities in the Area, such as REM mining in the seabed, is the United Nations Convention on the Law of the Sea (UNCLOS, 1982). Two thematic metaphors appear frequently in this body of international law. First, as with *Loi Organique*, drafters of UNCLOS based its statutes on the fundamental personification of states. Unlike *Loi Organique*, which was technically a domestic law, UNCLOS was a multi-party document that had to respect the sovereignty of states with diverse interests and histories. Specifically, whereas *Loi Organique* gave more autonomy to one member of the *Collectivité d'Outre-Mer*, French Polynesia, from France, UNCLOS is a complicated doctrine that was designed to bind

land-locked and coastal states, small and large states, and developed and developing states alike. First, personification in the international legal context enables states to claim and demarcate territory, thus distinguishing what area and what resources belong to whom. This is integral to UNCLOS because where a state's territory and sovereign rights end also demarcates where their authority over resources ends. Moreover, outside of states' territories are the High Seas and the Area, both regions with resources that are held in common. The area belongs to all humans, so the need to limit and control activities undertaken by states become more relevant. The common nature of the High Seas and the Area encourages individual states and corporations to pursue their interests to the detriment of the long-term interests of all humanity. Part XI, Section 2, Article 139 articulated the responsibilities of states, stating,

States Parties shall have the responsibility to ensure that activities in the Area, whether carried out by States Parties, or state enterprises or natural or juridical persons which possess the nationality of States Parties or are effectively controlled by them or their nationals, shall be carried out in conformity with this Part. The same responsibility applies to international organizations for activities in the Area carried out by such organizations... States Parties that are members of international organizations shall take appropriate measures to ensure the implementation of this article with respect to such organizations. (1982)

Here states and state parties are charged with responsibilities for their citizens and corporations. Moreover, they are members that must negotiate their previous membership in other organizations with the laws outlined in UNCLOS. Ensuring this, all states, regardless of their geographical or developmental status, benefit from the Area. Also, in order to protect the natural resources of the Area for posterity, UNCLOS created articles that ratifying states are legally bound to observe. Legal personality distinguishes a legal

actor as the origin of an action regardless of territory, culture, history, and developmental trajectory. If all states are international legal persons, formally, they have the equal rights to and responsibilities for the Area and its resources.

Personality is also a perquisite animating the common heritage of mankind doctrine in UNCLOS. Defined in UNCLOS, the common heritage of mankind is the “international regime designed to ensure equitable exploitation of the resources of the Area for the benefit of all countries, especially the developing States...” (1982). That is, those things deemed the common heritage of mankind cannot be appropriated by any one person or state, but are instead held in trust for the use and enjoyment of all people for all of time. A metaphor in this doctrine is the idea of heritage. The metaphor makes connections between the inheritance of property by reason of birth or that a piece of property that is handed down generation to generation with a person’s inherent right to the benefits accrued from the seabed. The metaphor effectively highlights the sense of inalienability because in the same way that one’s birth is all the reason necessary to inherit, simply being part of mankind entitles one access to the Area, so long as one observes the treaty and customary law pertaining to activities in the Area.

Thematic Metaphor Analysis

After an initial open coding of the textual documents in this thesis, patterns within and between the genres of each cultural regime emerge. As previously discussed, these patterns are not coincidental. Authors chose metaphors in order to frame understanding of foreign or complicated concepts. There are specific ways that each cultural regime is interested in resources and management. Moreover, there are specific ways that cultural regimes regulate norms, values, and beliefs concerning these topics. Regimes do this is by strategically choosing metaphors that emphasize the agenda they are pushing.

Therefore, the data points collected and analyzed in this thesis demonstrate evidence of overarching cultural conceptions of natural resources and natural resource management within regimes. Some genres had thematic metaphors in common, suggesting that both cultural regimes found these types of metaphors particularly useful towards furthering their respective biases and ends. The data also points to fundamental causes of conflict between cultural regimes. From these results, evidence of seabed mining's reality, wrought with the expectations, values, and beliefs of multiple cultural regimes becomes visible. Analyzed in the following section are specific examples of thematic metaphors specific to a cultural regime and thematic metaphors that wind through multiple genres. Thus, reckoning the advantages, disadvantages, and future of seabed mining in French Polynesia, is a complex study of multiple cultural regimes in conversation with each other.

Law.

In law, on both the federal and international level, personification was a pivotal metaphorical distinction. In both laws, personality created centralized authority and agency. That recognition of an individual's personhood invokes a sense causation and responsibility. That is, an act done by an individual can be traced back to that individual. In the same way, the actions taken by an entity with legal personality can be traced back to that legal personality. In doing so, it isolates responsibility. However, the point of dissolution in the personification metaphor is that where law is codified and limited, an individual person is not. Legal personality is limited because it holds certain entities accountable for their actions, while the countless rational and irrational behavior of people is not so easily explained or dealt with. The active position legal personality gives to actors and the relatively passive positioning of the REM creates a salient metaphorical

juxtaposition. In both *Loi Organique* and UNCLOS, the resources are the indirect objects, materials acted upon by a greater entity. From this perspective, the REM are a means to the ends of capital, tractable, movable and controllable.

Reports.

In the reports, “The Impact of Seabed Mining” and “A Concept for Seabed Rare Earth Mining” the gambling metaphors and agricultural metaphors appeared in both documents. Though the documents analyzed in this thesis are tokens of a larger body of works, the analysis indicated that these metaphorical themes were prevalent. In these two cases, the authors were ultimately in favor of seabed mining, though both spent considerable time meditating upon the risks and costs to the environment, corporations, and local peoples. Framing seabed mining and REM through agricultural and gambling metaphors captured the sense of risk while specifically emphasizing the beneficial outcomes, the likelihood of surplus and a jackpot. From this perspective, seabed mining and REM are an economic investment in the same way that a farmer invests initial capital in buying seed he or she may or may not be certain will come to fruition or a poker player buys into a round not knowing what cards will be dealt. Most importantly, these two metaphorical themes lend a sense of concreteness to seabed mining. The benefits from this enterprise are still potential; development, exploration, and some seabed mining ventures have been profitable, but the vast bulk of the benefits have yet to surface. However, the positive outcome of farming and gambling has already appeared. In short, these metaphors create a sense of tangibility for benefits that have yet to be seen.

Press Releases.

This is a similar case in the press releases analyzed in this thesis. Agricultural and gambling metaphors were used to describe the complex systematics and problems arising from seabed mining. The agricultural metaphors gave a heightened sense of productivity and sustainability. Drawing parallels between kernels and the growth of crops and the development of manganese nodules casts REM as a material that not only grows, but suggests, at least superficially, that they will grow back and the supply will replenish itself eventually. However, the timescale for crop cultivation and REM creation is vastly different. Nonetheless, the notion of continuous supply and plenty is a desirable feature of the enterprise and the natural resource to highlight. As in the reports discussed in this thesis, gambling metaphors highlighted the risks, benefits, and costs that a gambler weighs out with those of concerned parties. The actors interested in seabed mining invest money into a timely, costly, and complicated enterprise, hoping that the outcome will yield benefits that exceed their initial investment. Similarly, gamblers buy into game and hope they take the pot. The bargaining chips that represent the money a gambler wagered and can later be cashed in are analogous to the crops farmers harvest at the end of the season. These are both analogous to the REM raised from the seabed, refined, and value in money. Using crops and bargaining chips as a metaphor for REM conceptualizes REM as a helpful medium for value. Moreover, the crops, the bargaining chips, and the REM are passive pieces that are acted upon. They represent the value and the risk of the actors' choices.

Reports and press releases.

The cultural regimes generating reports and press releases also had agendas supported by certain, common thematic metaphors. An important characterization of

these documents was that they were written by experts in the field other interested experts or academics familiar with the jargon and methods of evaluation. On the other hand, experts consciously pare down the jargon for the general public in press releases, or third party actors digest some of the intricacies to make the press release short and interesting. In both cases, metaphors are still important tools for generating understanding, especially when dealing with cutting edge, complicated seabed mining technology. Hence, it is not surprising that press releases and reports would share most of the thematic metaphors surrounding the same topic. Clarifying and discussing these processes with fluency, amongst experts as well as laypeople depends on the use of common examples with features analogous and applicable. Consider the thematic agricultural metaphor the pervaded not only the report genre, but also throughout the press release genre.

Agricultural metaphors ranged from the spatial definitions by the use of “field” to distinguish areas rich in REM, from areas with hydrothermal vents, and from other areas not of interest to investors or seabed mining technicians. “Field” helps people construct boundaries around areas of interest in their minds. By thinking of the area in terms of “fields” the rest of the ocean and seabed drops away, and neither the author, nor the audience concern themselves with the arbitrariness of “fields” in the seabed context. In an agricultural context, a field is a bounded place, as the distinction between cultivated area and uncultivated area is defined by where the farmer sows and reaps his or her crops. Nevertheless, this notion of boundaries between areas that are cultivated and effected by the efforts of cultivation and those that neither cultivated nor effected by that cultivation was used to erect imaginary boundaries between areas of the seabed ripe for mining and those not. However, the seabed was not an area of cultivation; there was no farmer who planted manganese nodules to later grow into the rocky nodules mining companies are interested in. Rather, the “fields” that these reports and press releases refer to are areas

bound by arbitrary lines of economically or technologically feasible for extraction. Again, however, application of the Western, terrestrial agriculture metaphor draws the audience's attention to the area of interest, the field of manganese nodules, and distinguishes it the rest of the seabed. In reality, however, the rest of the seabed does not drop out. It is a continuous part of the seabed, despite the arbitrary distinctions humans place upon it. Whereas agricultural fields have more concrete boundaries between where they seeded and where they didn't, the seabed does not have even this amount of definitive distinction.

Despite the fact that none of the nodules have been cultivated by humanity and are in fact a product of geophysical and geochemical processes, both reports and press releases are quick to use agricultural metaphors to “” describe the creation of REM and the mining process. For example, Yves Fouquet's press release, “*Les ressources minérales et énergétiques du future son au fond des mers*” described the creation of manganese nodules as a kernel nucleus around which concentric rings of minerals slowly form (Fouquet, 2009). He also described seabed mining as the harvesting of REM from the seabed. Likewise, the report by Barkenbus, “The Impact of Seabed Mining”, said, “The possibility of tapping this abundant ocean resource raised expectations in some quarters that the entire international community could immediately reap the benefits” (Barkenbus, 1979). In both cases, agricultural metaphors were used to explain the seemingly alien and removed process of manganese nodule formation and the complicated procedure that collecting and raising REM to the surface would entail. However, a fundamental feature of metaphors is that they tend to draw attention to similarities between two phenomena while masking or omitting other qualities. For the most part, excepting the online news article in which the author seems to express some misgivings about the prospects and sustainability of seabed mining in Tahiti, the press

releases and the reports argue in favor for seabed mining. In typical Hegelian fashion, documents in both genres briefly address potential problems and grey areas surrounding seabed mining, such as a scarcity of legal precedence of mining seabed minerals in international waters or obtaining rights to do so in another state's EEZ, negative effects on the benthic environment, or nuisances or injuries to third-party actors. These, however, are relatively quickly allayed through general provisions such as those listed in Article 150 or reassurance that seabed mining is a relatively non-invasive procedure with minimal projected damage to the environment. Agricultural metaphors play an important role both in providing general understanding for the public and advertising the profitability and manageability of seabed mining. Describing the formation of manganese nodules as concentric growth around a kernel gives the general public a gloss of the complicated processes that go into the formation of a nodule. However, the agricultural metaphor is carried further in Barkenbus' observation that benefits could be reaped from seabed mining or that "Cobalt crusts (also known as ferromanganese crusts) usually grow on hard rock surfaces on seamount flanks..." (1979). The recurrence of agricultural metaphors within and between genres lends a sense of cultivation. Whereas a farmer can harvest a crop of plants, so too can miners harvest a crop of nodules. However, the metaphor cannot be taken too far; one of the points of dissonance in this metaphor is the organic nature of terrestrial crops in comparison to the mineral, inert nature of manganese nodules. Indeed, nodules develop as the result of various geologic processes, but they do not grow in the same way that plants grow. More importantly, neither manganese nodules nor any other of the minerals of commercial interest regenerate or reproduce in the seasonal or timely fashion that plants do. In this way, crops are more sustainable, able to be cultivated, harvested, and replanted, while nodules are not. Superficially though, the audience makes a connection between the tractability and recyclable productivity of

agriculture with the mining for REM on the seabed. The open-ended nature of the metaphor not to mention the vast unknown posed by seabed mining makes it difficult to accurately gauge the extent to which the metaphor is sound and when it dissolves. Therefore, the analysis demonstrates that agricultural metaphor operate in documents in both press releases and reports in a way that makes seabed mining seem like simple, non-invasive, and controllable enterprise.

The critical discourse analysis of the textual documents evaluated in this thesis first resulted in a sketch of some of the metaphors concerned with REM and seabed mining used in each document. The subsequent analysis showed that while some constructions of seabed mining, natural resources, and natural resource management were characteristic of certain genres, other thematic metaphors appeared across genres. For example, while sacredness appeared in the myth of Hina and Puhi and in Hiro's poetry, none appeared in the laws, reports, or press releases analyzed. One imagines that the esoteric would not be so quickly embraced by reports, legal documents, or press releases. That being said, metaphors concerned with Western paradigms of agriculture and gambling and occurred most frequently in both press releases and reports.

Chapter 4: Nodules

Though this Fairclough-style, metaphorical analysis appears like a professorial exercise, it was not intended to be used as one. Too often, linguistic anthropological work is shunted to the side as unpractical and cumbersome. Here though, I would like to stick in my *ho'e* and say that this work and the work the audience has just undertaken has some traction for understanding a complex material in the real world.

There is always another side to a story, and as in the case of many complex and volatile subjects such as seabed mining, there are many. In the analysis above, metaphors were identified and tracked within and between documents produced in various genres and by different actors. Each one of these documents told a nuanced story that not only framed natural resources, but was partly constructed by them by connections inferred by metaphor. As in the *ha'ari* creation myth retold in the beginning of this thesis, natural resources, specifically REM from the seabed, were explained and valued in different but telling ways. Not only did the analysis distinguish some of the narratives of particular cultural regimes by their metaphorical composition, but it also revealed distinct similarities and differences in the employment of certain thematic metaphors. But what does that mean? And why should anyone care?

To answer the first question, if a thematic metaphor appeared often throughout a given genre, it is not coincidental. There is something about that metaphorical theme that is animating in a way that the authors within that cultural regime and writing in that genre find potent and useful to further their purposes. The analysis pointed out moments of connection between the two phenomena the authors were comparing. Both are integral to studying the structure, use, and meaning of metaphors. Without points of connection, the similarities between an experience one transposes and uses to understand another disappears. The analysis also indicated some points of dissolution, where a feature of one

experience was dissimilar to the comparable feature in the other. These dissolution points represent moments of cultural difference and nuance. Nuance is what distinguishes the phenomena from each other. Moreover, though nuance seems slight, these virtually invisible differences alter the conceptualization and framing of an object, in this case, seabed mining and REM. Metaphors gloss over the points of connection and points of dissolution, creating a subtle, general, and shareable understanding. Yet upon closer inspection the gloss resolves into the infinite points of connection and dissolution. It is because of this imperfect comparison that one can generalize and simplify a complex phenomenon. It is by streamlining the infinite inputs of information that one is depolarized and able to make decisions and function in a world seething with metaphors.

If a metaphorical theme appeared across genres and is used by many cultural regimes, it indicates that this metaphor, and perhaps the agenda that it furthers, is particularly active amongst relevant actors. When a metaphorical theme repeats across genres, the likelihood that more people are exposed to a metaphorical message and the amount of time they are exposed to that metaphorical theme increases. While this does not necessarily account for an individual's opinion about seabed mining, natural resources, or REM, it still represents a significant influence pressing upon that individual or group.

As evidenced in the summary of thematic metaphors above, the reports and press releases written by institutes, corporations, and law-making bodies on both federal and international levels used metaphors that conceptualized natural resources and by extension, the environment as a whole, as passive, predictable, and controllable. However, discourses such as the *ha'ari* myth or poems written by Hiro referred to in the introduction of the thesis constructed natural resources and the environment as a dynamic relationship between entities human-like. The natural resources became actors because

of their ability to feel, think, and live. In the sample of documents from genres used by different cultural regimes, the use of passive-posing metaphors, especially gambling and agricultural metaphors, outnumbered the use of active-posing metaphors. Here is the rub; there are mismatches of conceptualization of natural resources, natural resource management, seabed mining, and REM at every level of the analysis in this thesis. Each document was made up of a different composition of metaphors, whether they fell into an overarching theme or not. Moreover, when the genres were analyzed, the metaphorical themes were sometimes the same and other times different. This suggests that some cultural regimes have agendas in common and others that that differ completely. These similarities and dissimilarities are evidence for why seabed mining is so contentious; the various conceptions of these phenomena circulating differ even as they come into conversation with each other. On this fundamental level, these conceptions and the values, beliefs, and practices stemming from them are not congruent all the time. The many conceptions of a highly valuable natural resource, such as REM, are evidence for the spectrum of sentiment and opinions French Polynesians and other interested actors have about seabed mining for REM.

As for the second question, the analysis above created a way to grapple with a phenomenon both technologically and scientifically dense, and situated at the confluence of many conceptions. Grasping seabed mining and understand all the implications it has for different people hinges on understanding the fundamental discrepancies in conceptions. The results of the thesis indicate that actions regarding seabed mining will affect cultural regimes differently. For example, in a pollution event, an actor who was sympathetic to the construction of the environment in the *ha'ari* myth or Hiro's poetry could be upset that the ocean, marine life, and human health were compromised by practices that were destructive to the environment to begin with. Perhaps he or she

already viewed the seabed mining enterprise as another colonial crutch which will leave French Polynesia, in the long run, more dependent on foreign aid than ever. On the other hand an actor sympathetic on some level to the rhetoric in some of the press releases, reports, and legislature could also be upset, but because they were found legally liable or the pollution constitutes a profit loss. The values of each actor and the outcomes that concerned them are different, even though the source and the materials are constant.

Leaving these conceptions invisible makes ignoring, misrepresenting, or generalizing these complex cultural values easier. These generalizations are useful because they favor interpretations supportive of different cultural regimes and potent because they create powerful juxtapositions. However, thematic metaphors obscure the particulars of complex realities, and the nuances of the phenomena are lost in generalizations. Thus, these metaphorical constructions have not only cultural weight, but political weight as well. Iseult Hanohan described the role and importance of metaphor as a means of predisposing and orienting conceptualization and experience of phenomena thusly:

Metaphors do not merely embellish political language but rather play a part in structuring the field of politics itself; those that achieve widespread use highlight certain aspects of social life and occlude others. They entrench distinctions between things we might otherwise tend to think of as united in a single whole and posit relationships between things we might otherwise tend to think of as separate. They provide a shorthand that makes it possible, or easier, to handle complex realities. They may make it possible to conceive of certain ways of living and acting and thus play a significant part in constituting social reality. (Honohan, 2008).

REM extraction of the seabed is one such complex reality. Besides being a relatively recent prospect, seabed mining is technically and scientifically complex. Moreover, seabed mining yields high-value materials with complex legal, political, economic, and environmental repercussions. It is also geographically distant from French Polynesia, as the mining can take place hundreds of nautical miles from shore and well out of the eye of the public. For these reasons, the impactful, heuristic qualities of metaphor make them useful to describing and explaining seabed mining, regardless of their position on the subject. By using certain thematic metaphors, the author of a document makes choices about what qualities of seabed mining are important to communicate, what familiar images illustrate these qualities, and how these comparisons further their position. The metaphor's tendency to obscure and illuminate certain qualities about seabed mining, be that the cost-benefit analysis in a gambling metaphor or the sense of sustainability provided by an agricultural metaphor, give it political power. This implies that regardless of the position one takes in seabed mining, metaphors are one way cultural regimes quickly and persuasively construct values, beliefs, and reasons which support their perspective.

Culture is constantly formed in the space between people. Bruno Latour described this situation as “diplomatic”, where two or more people come together and must navigate the convergence of different cultural seas (Latour, 2007). Anna Tsing also pointed out in her book, *Friction: An Ethnography of Globalization*, that in an increasingly globalized context where cultural regimes such as those described above come into contact with each other frequently, cultural moments of similarity and difference become exotic, awkward, and surprising (Tsing, 2011). Metaphors are just one way that actors create and cope with these strange exchanges. Humans were always engaged in the diplomatic process of dealing with the reality and realities of other people.

The rapid pace of globalization brings different people and ideas into closer contact with each other than ever before. In order to navigate through these contacts, more diplomacy becomes necessary.

In this case, awareness about the metaphors one perpetuates and those circulated by other cultural groups encourages fluency and negotiation between competing perspectives. People influenced by many cultural perspectives can advocate for themselves better by knowing more about the fundamental constructs that frame the narratives they are exposed to and propagate themselves. Furthermore, awareness and understanding of the values and beliefs that animate other narratives creates an environment that encourages curiosity and conversation, especially when perspectives conflict. An actor is entitled to their opinions and beliefs concerning seabed mining, whatever they are, but they should have the knowledge of tools that support their arguments and other people's positions. In regards to seabed mining, it is especially in the best interest of people in the vicinity of seabed mining in French Polynesia, those who will bear some of the financial, cultural, and environmental costs and benefits, to understand and take into account the stakes that are beyond the stories they are habituated to hearing and generating. For too often, the constructions other than the narrative one purports, remains invisible. Studying metaphor and any of the ways that groups construct and exert power is useful, educational, and empowering.

In other words, the complex, overlapping, and globalized experience of seabed mining requires transparency. This is not in the sense that one can know everything about why or how a group constructs phenomena a certain way; this is the eternal task of the anthropologist. Rather, this thesis aims to create a moment of transparency between cultural regimes. It means that cultural regimes, authors, and audiences should look for

the perspective of those outside of their genres and cultures to become better informed and more articulate in the moment of cultural awkwardness when perspectives conflict.

Furthermore, This is not a call to simplicity, indeed, this kind of transparency is retarding. Pausing on man levels, whether it is during a conversation in line at the Super Manava or in the French Senate, yields delay and costs. Yet a pause before beginning a process concerning such a volatile and valuable material may result in more intelligent practices concerning resources such as REM. Pausing, curiosity, and transparency may be worth the delay and financial costs. This makes seabed mining, REM, and the multitude of conceptions bound to them visible will not necessarily prevent mining nor completely deter it. However, taking into account more of the interests that factor in and bear upon seabed mining will foster trust and help develop more comprehensive business practices and solutions.

Seabed mining for REM is certainly an enticing economic opportunity. The French Polynesian economy has diminished since the removal of the vast majority of the French military presence. The naval base was an important source of local income, as sailors required the goods and services provided in Papeete. Since then, poverty and the number of homeless people have risen. While studying abroad in Punaauia in the summer of 2013, my Tahitian instructor explained, “People from all over the Pacific came to Tahiti. There were more jobs here, but now people are no longer making enough money to support themselves. They end up selling their land and coming to the city, only to find that there is no more work” (T. Coulon, personal communication, July 2013). Moreover, the major industries in Tahiti and throughout French Polynesia are pearls, tourism, and fruit. However, these have been compromised by a weakened and more conservative international and foreign economies and competition with more accessible locales. Contracts with foreign investment groups and France to exploit REM from French

Polynesia's EEZ are being heralded by supporters as a stable and profitable export that could provide job opportunities for many French Polynesians and provide much-needed triage for their economy.

As a bargaining chip, REM mining of the seabed has political weight as well. However, a major impediment that continues to hamper pro-independence referendums is French Polynesia's vulnerable and dependent economy. Furthermore, its relatively remote location far from many mainland ports significantly raises taxes and the cost of living. However, seabed mining has the potential to make the islands, Tahiti in particular, a more profitable port of call for foreign investment. Aside from the temptation of a vast supply of a highly valuable and newly exploitable natural resource, French Polynesia is ripe with a large pool of low-wage workers, a centralized location, a sizable port, and a developed infrastructure. And though some French Polynesians believe that seabed mining will harm the environment and further erode *Ma'ohi* culture, some French Polynesians believe that seabed mining could stimulate the economy or perhaps even fund independence from France, while others fall somewhere in between.

However, French Polynesia is no stranger to mineral extraction by foreign companies, and has witnessed the damage to economic and ecosystem health. Mineral extraction on other South Pacific islands has led to financial and political devastation due to capitalistic, exploitative extraction methods, mismanagement, and poor investment. French Polynesia also experienced a significant economic downturn when France halted nuclear testing in the South Pacific. As soon as the resources were used up or public pressure became unbearable, the jobs and foreign money left the islands. Ecologically speaking, many reports and press releases have stated that the benthic system is one of the least understood ecosystems in the world. Scientists are unsure how seabed mining could negatively impact the environment. In order to predict and minimize damage to the

environment with more certainty, more studies will need to be undertaken. Though history might advise against it, if French Polynesia proceeds to permit exploration and exploitation of its seabed resources, it should be done so by weighing carefully the beliefs, values, costs, and benefits to the people affected by it.

This situation demonstrates the polity of metaphors beautifully. Carefully deploying metaphors as glosses orients the audience towards a position sympathetic of the speaker while also facilitating understanding by their terms. Affinities towards certain metaphors evidence closely held affinities towards certain cultural facts, norms, and regimes. On the macroscopic scale, these influence our daily actions and behaviors. Since the passive metaphors in this thesis were more frequent and used across more genres, these findings suggest that the passive conception of the environment, the construction of natural resources as vessels for money, and the capitalist interaction and use of them is dominant. This is not to say that the active conception of the environment and natural resources has no pull. The active conception exemplified in work by Hiro and the myth of the *ha'ari* circulate ideas of others. However, the conversation between these dominant currents in constructions of the seabed mining and REM are constantly in flux.

Seabed mining for REM in French Polynesia is a volatile object, the nexus point of a multitude of cultural constructions from many groups. Anthropologists have long noted that the way people talk about a phenomenon impacts the way they think about it and vice versa. However, how to negotiate an object that different cultural regimes conceive and value diversely poses a bedeviling and pragmatic problem. If the fundamental ways groups understand a valuable object differ, how can reports, press releases, and legislature reflect and respond to this complex reality more accurately? Working with seabed mining and REM solely within one's values and experiences is a choice to mask other valuable features. Transparency and a close look at the stories we

participate in disallow actors to be irresponsible; it becomes more difficult to lie out of omission and forces us to address dissenting voices. The findings of this thesis engage people in an awkward dilemma, for knowing applies a certain amount of responsibility. The thesis presented one way to not only reconsider economic, scientific, and political as cultural narratives, but also make human health, morale, aesthetic, and cultural heritage more visible.

Though perfect transparency is impossible given the dynamic and multitudinous character of conflict minerals such as REM, those “romantic” values become increasingly difficult to ignore the closer one examines a volatile object. Each document analyzed in the thesis was found to be composed of different metaphors. However, when these documents were organized by genre, themes of metaphors appeared, surrounding agriculture, personification, or gambling. Some thematic metaphors were exclusive to the genres in this thesis, while others occurred across many. For example, there were more examples of metaphors that pose natural resources and the environment as passive such as agricultural or gambling metaphors than metaphors that treat them as active agents such as sacredness. The more a metaphor occurred across metaphorical themes, the more likely that the way these metaphorical constructions were prevalent in French Polynesia and other interested cultural arenas such as the academy, government, or media.

There remains much to say about the constructions of seabed mining in French Polynesia and other troubled locales around the world. Although seabed mining in French Polynesia is a localized event, it is neither the first nor last shift in cultural perceptions of such a volatile and impassioned topic as conflict minerals. As previously mentioned, the South Pacific has a long history of mineral extraction beginning with the earliest European explorers and their use of Tahiti and other islands as an refueling oasis, to the exploitation of guano, phosphates, nickel, silver, and gold. Seabed mining is just the most

recent example of natural resource extraction to hit the islands. The difference now is that the global reserves for the materials previously mined and REM are rapidly declining. In fact, many of the nations and corporations interested in seabed mining in French Polynesia do so because their own reserves have dwindled and the need for stockpiling is at hand. Even outside of the Pacific, natural resource extraction has had a notoriously bloody and costly effect upon indigenous, local peoples such as colonial Africa. REM is just one example of a contemporary “land grab”, but many more are occurring in other places around the world such as Coltan mining in the Democratic Republic of the Congo.

Creating transparency and analyzing such a dynamic processes in the future will require analyses beyond the metaphorical and evidence beyond the linguistic, though these methods are robust and useful. Another discourse analysis could include a larger number of documents and a broader range of genres to evaluate. Neither this thesis, nor any anthropological work can be a perfect summation of all groups interested and affected by REM mining of the French Polynesian seabed. Neither are the generic distinctions nor metaphorical patterns wholly representative of those cultural regimes’ attitudes. Furthermore, ethnographic work will offer more insight into how individuals exposed to various cultural regimes react and respond to the complex reality posed by seabed mining. That being said, more anthropological inquiry into constructions of natural resources will heighten awareness and better inform decisions concerning the management of these precious and entangled materials. Indeed this study must be further enriched and informed by further research; it is but a drop in the ocean of work to be done on this topic.

REM mining of the seabed is one complex reality, but the human experience is increasingly filled with embroiled materials and events. Considering the claims of groups and individuals beyond ourselves creates a crisis of conscience and consciousness. In

other words, besides the exasperating problem of discerning as many of these relationships as possible lies the difficulty in remembering them and remaining open-minded and sensitive to the infinite ways in which they interact. Rather than being intimidated into inaction and avoidance, it may better serve to be humbled by the challenge and intrigued by its prospects.

Mana told me another story. Once, there was a young and beautiful Tahitian princess called Hina. One day, her father, the *ari'i nui* betrothed her to a grand prince of the island, but told her she could not see her groom until the day of the wedding. Hina agreed, but on her wedding day, as she approached the grotto where she was to be wed, she chanced a glimpse at her future husband. Instead of a handsome man, her groom was a gigantic *puhi*. Horrified and disgusted, she turned around and fled, crashing deep into the forest. But the *puhi* had seen her and called after her retreating back, "I will find you! And just wait! One day, princess, your lips are going to touch mine!" Hina hardly heard, crying she reached the beach and threw herself down onto the sand. But she found that she was not alone. Fishing in the lagoon was the god, Ta'aroa. "Please!" She implored, "Save me from the ugly *puhi* I am betrothed to marry!" Ta'aroa put aside his fishhooks. "I will help you," he agreed, "but you must follow my instructions closely!" Hina eagerly agreed, for she could already hear the *puhi* pursuing her. Ta'aroa the clever fisherman cut a lock of Hina's shining, black hair and baited it at the end of his hook. He dropped the line into the lagoon and waited. Soon, the *puhi's* sleek and winding body came swimming into the lagoon. Recognizing Hina's hair, he promptly bit and got caught on the hook. As the *puhi* was struggling, Ta'aroa quickly lopped his head off and it fell into Hina's arms. As he was dying, the *puhi* looked at Hina and said, "Just wait, princess! One day your lips are going to touch mine!" Ta'aroa took the head and wrapped it tightly in *tapa*, saying, "Hina, you must carry this head with you at all times. Never set it down and never

let it touch the ground!” Gratefully, Hina agreed. She thanked Ta’aroa and began the journey back to her father’s village. On the way there, however, the sun rose high in the sky, and Hina got hot. Seeing a fresh spring, Hina happily skipped to the water, setting *puhi*’s head down before bathing in the cold water. When she came back, *puhi*’s head was gone, and in its place was a slender tree with long fronds and hard brown fruits, the first *ha’ari*. Thirsty, she reached up, and plucked one of the fruits. The fruits were hairy with three spots on the top. Hina used a sharp stone to poke a hole into one of the holes. As she drank the sweet water inside, she found herself face to face with the *puhi*’s beady eyes and her lips pursed over his. Then she remembered the *puhi*’s warning that someday her lips would meet his. Hina realized that though the *puhi* was ugly, he was kind and loving. She took the fruits from the *ha’ari* and spread them across Tahiti and the islands of the Pacific.

Which one is true? Compelled by a need for clarity, I had to ask. Mana looked up at the *ha’ari* and shrugged. “They are both true. There are many stories about this place, but this is the one I like best.”

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Appendix

Table A1. Les ressources minérales et énergétiques du future sont au fond des mers

| Page | Excerpt |
|------|---|
| 1 | ...avec l'envolée du cours des métaux ces dernières années les état dépendent déjà fortement d'importations et minéraux métalliques et de métaux dits de haute technologie. |
| 1 | se tourner vers la mer pour répondre a la demande mondiale en énergie et matières premières. |
| 1 | cela ouvre un champ nouveau pour l'exploration et l'exploitation future. |
| 2 | l'horizon 2030 |

Table A2. Exploitation minière en eaux profondes: la précaution est recommandée

| Page | Excerpt |
|------|---|
| 1 | Les recherches concernant les minéraux en eau profonde et leur possible exploitation <i>dans le futur</i> offre un potentiel économique <i>émergeant</i> pour les états du pacifique |
| 1 | Nous avons tous <i>un rôle important à jouer</i> en termes de communication au sujet de l'exploration minière en eau profonde et du possible exploitation dans le futur, en relayant les préoccupations des peuples du Pacifique, dans le cadre d'un dialogue constructif, aux preneurs de décisions. |

Table A3. Les ressources minérales du futur sont-elles au fond des mers?

| Page | Except |
|-------|--|
| 55 | "L'humanité a un <i>besoin</i> vital de <i>découvrir</i> de nouvelles <i>ressources naturelles exploitables</i> ..." |
| 55 | "Tout comme les énergies, les ressources minérales sont un élément <i>clé</i> du développement des économies industrielles et <i>ne sont pas davantage renouvelables</i> . <i>L'envolée du cours des matières premières et des métaux nous incite à rechercher de nouveaux gisements</i> " |
| 55 | "nous commençons maintenant à apprécier pour leur <i>intérêt économique</i> " |
| 55 | "...est encore relativement inconnu, alors que <i>ses richesses</i> pourraient très bientôt devenir <i>précieuses</i> pour répondre <i>aux besoins</i> moniaux en énergie et matières premières." |
| 56 | "Ces découvertes ont ouvert de nouvelles <i>frontières</i> pour la recherche et l'exploitation de ressources minérales et énergétiques <i>dans les océans</i> ." |
| 56 | "on a pu mettre en évidence la présence d'une multitude de métaux, très différents d'un minerais à l'autre....et qui <i>pourraient devenir intéressants à exploiter</i> ". |
| 56 | "dans le cas des nodules polymétalliques, des encroutements corallifères et des sulfures hydrothermaux, les métaux se déposent directement sur le plancher océanique, ce qui faciliterait leur "ramassage..." |
| 56 | "Un autre facteur qui nous encouragerait à nous tourner vers ces gisements marins est la facilité à déplacer des installations spécifiques sur un navire." |
| 56 | "Il faut d'abord comprendre précisément les processus géologiques et chimiques mis en jeu dans la concentration des métaux au fond des océans, et déterminer ensuite la richesse des dépôts métalliques, avant d'étudier enfin la faisabilité de leur exploitation" |
| 56 | "chaque ressource minérale de la mer est un défi en soi, chacune ayant son histoire, ses particularités et ses mystères pour l'homme" |
| 59 | "les premiers nodules polymétalliques furent <i>récoltés</i> par faible profondeur dans la mer de Kara en 1868" |
| 59 | "Des concrétions rocheuses en forme de boules sombres de quelques centimètres de diamètre ont été découverts sur le plancher océanique"... "Le navire britannique Challenger découvrit que les nodules étaient communs dans les grands fonds océaniques" |
| 59-60 | "Bien que communs, les <i>champs</i> de nodules ne présentent pas tous le même intérêt, car leur <i>abondance</i> et leur <i>richesse</i> en métaux varient énormément" |
| 61 | "des fragments d'organismes servent même souvent de point de départ de "nucleus" pour la formation des nodules" |
| 61 | "outre les phénomènes physiques de sédimentation, il semble bien que la vie, la dynamique des plaques lithosphériques et les variations climatiques globales <i>jouent un rôle</i> essentiel" |
| 61 | "Les nodules polymétalliques sont constituées de couches concentriques correspondant à des phases de croissance successives autour d'un <i>noyau</i> central" |
| 61 | "La zone Clarion-Clipperton est particulièrement riche en cuivre, nickel, et manganèse." |
| 63 | L'exploitation des nodules implique de réaliser des cartes haute résolution et de comprendre les processus de formation des nodules les plus riches". |
| 63 | "La France, qui a obtenu deux permis miniers dans le Pacifique Nord, a proposé différentes approches technologiques pour leur exploitation..." |
| 63 | "Afin de limiter cet impact, il faudrait préalablement étudier la biodiversité et le fonctionnement des écosystèmes associés". |
| 64 | "La principale "mine" se trouve au fond de l'océan Pacifique...découvert un trésor de dépôts riches en cobalt et platine, dont la France se trouve être un heureux héritier. En effet, les dépôts les plus riches se situent en Polynésie, et particulièrement dans les eaux économiques françaises". |
| 67 | "Les enjeux d'une exploitation des encroutements pour le cobalt et le platine sont réels. Mais à quel prix et avec quelles technologies? Il manque encore des données de terrain et des calculs précis: contrôles géologique de zones riches, continuité des dépôts, rugosité du fond, influence du substratum sur la dilution au ramassage" |

| | |
|----|---|
| 68 | "Lorsque l'on découvrit sur certains sites la présence de dépôts riches en éléments métalliques, Il apparut que les fonds océaniques pouvaient <i>receler</i> de véritables mines!" |
| 70 | "ainsi l'activité hydrothermale est un important mécanisme de concentration des métaux, qui s'accumulent sous forme d'amas de sulfures polymétalliques: une mine pour l'homme!" |

Table A4. Ia ora te natura

| Page | Excerpt |
|------|---|
| 1 | Grande Tahiti au mille rivières ténébreuses, Tahiti au mille chants d'oiseau |
| 1 | A toi Oroena, Qui se dresse dans le ciel immense, Toi, le sommet qui chante mon pays |
| 1 | Tahiti du monde polynésien, Embrasse-toi du grand amour, Et enfants et descendances chéries |
| 1 | En réalité la voici, Tu dois la vie au tronc des origines |
| 1 | Le manger et le boire, Dormir et assujettir, Presser la natte de l'hospitalité, Jouer faire chanter le poème, Guérir et pêcher, Produire le feu et toute chose de la vie |
| 1 | C'est lui la ha'ari pour toi, ta tête sacrée, qui fit chanter les entrailles du poète...source de vie, vraiment |
| 1 | La main, la branche, et la feuille, la tête, la 'uru, la tête sacrée, multitude de 'uru quand vient le temps de la maturation, multitude s'écrasant par terre dans leur grande maturation... 'uru qui t'a nourri depuis ton, enfance jusqu'à ta descendance |
| 1 | 'Uru, toi, mon sacre, 'uru toi, mon origine, 'uru toi, mon roc |
| 1 | Jamais ne mourra source de vie vraiment |
| 1 | Chérissenment et Protection, planter et remuer la terre jusqu'à nouveau rejet sacré |
| 1 | Hommage à la tête sacrée, hommage à la pousse sacrée, hommage à la nourriture sacrée, hommage à la boisson sacrée, hommage à la vie sacrée |
| 1 | Ton être sera submerge par les courants de la terre, s'enroulant autour de ton corps longtemps, tu seras submerge ton cœur submerge ton âme submergée ton esprit submerge |
| 1 | Aime, aime d'amour, aime le tronc des origines, aime le pays qui t'a vu naître |

Table A5. Oihanu

| Page | Excerpt |
|------|---|
| 355 | "A avari I te rahui, faa'amu ite hua'ai." |
| | "E atua pao, e atua tarai, e atua faati'a, e atua haamau, I te varua I te iho humu ma'ohi |
| | Those who belong prostrate before this, they love, this they venerate, before this they submit |
| | Because this is the foundation of all foundations, the thread of unity, a healing, clear water, a wholesome source |
| | Put back in place the rotten bones, stick together again the spoiling flesh, stretch the fouled veins, to channel the knotted blood, instill a pure breath so that Oihanu breaths, breathe your faithful breath, for it is the breath of future generations |
| | "following the deep night of time up to infinity...but a foreign light beats down on him...the time passes and the weakening light" |
| | Tie on your red <i>maro</i> , tie on your yellow <i>maro</i> ... |
| | by necessity go, by urgency on the <i>marae</i> , of sacred relics displayed, eyes sweeping the long space... |

Table A6. The Impact of Seabed Mining

| Page | Excerpt |
|------|--|
| 45 | "The possibility of <i>tapping</i> this abundant ocean resource raised expectations in some quarters that the entire international community could immediately <i>reap</i> the benefits". |
| 45 | "The struggle of miners to <i>win</i> exceedingly small concentrations of the desired minerals from the foundation in which they are embedded is certainly not elegant..." |
| 45 | "The inability of the U.S. negotiators to make this a persuasive case goes to the heart of the controversy." |
| 45 | In fact, the arguments <i>marshaled</i> by the negotiators have been so transparently self-serving that the United States never has gained the credibility required to convince others of their merits." |
| 46 | "The potential global impact of manganese nodule mining has been at the <i>heart</i> of the dispute over mining for more than a decade now." |
| 46 | "the engineering feat required to <i>raise</i> nodules and what he felt was the lack of government support" |
| 46 | "Sergio Thompson-Flores of Brazil discussed the need to create a strong international organization to ensure that benefits from mining would accrue to all nations. |
| 46 | "U.S officials, <i>on the other hand</i> , claim that <i>in the long run</i> , all mankind will benefit from the mining of manganese nodules." |
| 46 | "Because the question of who benefits from mining has been on <i>center stage</i> at UNLOS..." |
| 47 | "The assessment has not tried to peer too far into the future..." |
| 47 | "cobalt consumption" |
| 48 | "the <i>market</i> for cobalt could <i>expand, absorbing</i> at least a portion of the extra supplies." |
| 49 | "it is not <i>clear</i> whether such an amount would have a discernible effect on market price". |
| 49 | "Even with 20 firms producing copper from the ocean in the year 2000 no more than 1.5% of the world's demand for copper could be met from ocean sources. |
| 59 | "...the creation of an international organization to manage and regulate activities on the deep ocean seabed would be facilitated immensely by the rather <i>meager resource pot</i> that has now been allotted to the international community." |
| 59 | "the distribution of vast <i>ocean wealth</i> was not at <i>stake</i> ." |

Table A7. A Concept for Seabed Rare Earth Mining in the Eastern South Pacific

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|----|--|
| 1 | "The seabed is the bottom of the ocean, or the top of the earth's crust which is overlain by oceans...subsea extension of the continent itself...continental slope...continental rise, abyssal plain, deep-sea trenches...seamounts, underwater mountains...mid-ocean ridges". |
| 8 | "The fluid issues from chimneys which may vary from a few centimeters to several meters long and mixes with the surrounding seawater to form characteristic black "smoke". |
| 8 | Hydrothermal vents occur in 'fields', that is, clusters of vent chimneys within an area of a few hundred square meters. |
| 10 | Cobalt crusts (also known as ferromanganese crusts) usually grow on hard rock surfaces on seamount flanks..." |
| 11 | Each has its own peculiar features and challenges, but a major factor affecting mining decisions is whether the resources occur on seabed controlled by a nation (in the EEZ) or on seabed controlled by the ISA. |

Table A8. UNCLOS: Article 139 and Article 150

| Page | Excerpt |
|------|--|
| 1 | State parties shall have the responsibility to ensure that activities in the Area, whether carried out by State Parties, or state enterprises or natural or juridical persons which possess the nationality of States Parties or are effectively controlled by them or their nationals, shall be carried out in conformity with this Part. The same responsibility applies to international organizations for activities in the Area carried out by such organizations...States Parties that are members of international organizations shall take appropriate measures to ensure the implementation of this article with respect to such organizations. |
| 1 | Common heritage of mankind |

Table A9. Loi Organique

| | |
|---|--|
| 1 | Le domaine public maritime de la Polynésie française comprend, sous réserve des droits de l'Etat et des tiers, les rivages de la mer, y compris les lais et relais de la mer, le sol et le sous-sol des eaux intérieures, en particulier les rades et les lagons, ainsi que le sol et le sous-sol des eaux territoriales. |
| 1 | Les dispositions de l'alinéa précédent s'appliquent sous réserve des emprises nécessaires, à la date de publication de la présente loi organique, à l'exercice par l'Etat de ses compétences et tant que cette nécessité sera justifiée. |
| 1 | La Polynésie française régit et exerce le droit d'exploration et le droit d'exploitation des ressources naturelles biologiques et non biologiques des eaux intérieures, en particulier les rades et les lagons, du sol, du sous-sol et des eaux sur-jacentes de la mer territoriale et de la zone économique exclusive dans le respect des engagements internationaux. |