Buoyant Clarity

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Buoyant Clarity investigates the dialogue that exists between two distinct, yet infinitely connected environments: of land and of water. Specifically, Buoyant Clarity attempts to interrogate an existing infrastructure, its relationship with mankind and the environment it inhabits. The description of environment will be broken into the discussion of edge condition and analyzed through the lens of ecology. The dialogue cultivated through the relationship of land and water manifests in the territory of the edge. The difference between land and water, or terra firma and aqua firma, is found in the infinite edge of attraction, defined by history through great potential and ultimate devastation.

BUOYANT CLARITY

_Terra firma -dry land; the ground as distinct from the sea or air.

_Aqua firma - wet environment; marine habitat as distinct from dry ground.

Traditionally, engagements within the edge that bind mankind with the two environments include: mobility/transportation, the extraction of sustenance, harnessing of embedded power, navigation and way finding, and most significantly life source in the form of hydration. Human interest in the potential of the unfamiliar or foreign territory of aqua firma positions mankind to engage with the environment through the development of a dialogue. The environmental dialogue is framed through tension; the anomalous aqua firma environment is foreign to the physiology of human beings and requires a new set of navigational tools. The resolution to control environment is re-framed, and the ecological lens of coexistence is re-introduced. The environmental tension focuses human intentionality to explore the extremes of control or of coexistence. These two distinct realms'(control and coexist) and their associated ecological constructs will reflect two distinctly different existences, or relationships, through mankind's impact.

"The military engineers of the Commission have taken upon their shoulders the job of making the Mississippi over again — a job transcended in size by only the original job of creating it."

—Mark Twain, Life on the Mississippi, 1874

Mankind's ability to, code, decode and unfurl the embedded characteristics within the ecological network of the contiguous body of water encompassing nearly seventy percent of the earth's surface (made up of oceans, seas, lakes and rivers of both freshwater and saltwater), has expanded our potential power as a civilization. As Mark Twain's writing from the 19th century suggests, human inhabitants are not comprised of an independence from the environments terra firma and aqua firma; contrarily, mankind's' conscious understanding of choice invites the responsibility and task of environmental steward; a coexistence with, in opposition to control of. Mark Twain's reflection introduced above, exposes the insurmountable task the act of controlling natural environment will entail, in his 1874 description of the military's engagement with the Mississippi River. The paper Buoyant Clarity will seek to explore and explain the important perspective of human inhabitants to catalyze a dynamic and symbiotic relationship between the two terras, terra firma and aqua firma, existing within a single ecological environment.

EDGE CONDITIONS

The term edge, specifically water's-edge, when speaking directly to the meeting of land and water, will be framed through two distinctly different methods. The first definition, *conceptual edge*, belongs to consciousness, and exists as an infinitely thin, spaceless moment where water physically overcomes land, or the condition where land slips below the surface of water. The spacelessness of edge can not be physically inhabited and belongs only to the moment where neither land nor water exists, marking the beginning and ending of two clearly divergent environmental conditions. The shift from land to water, as a spaceless edge, exists solely in one's conscious, acting purely as a marker, or a *conceptual edge*, instantaneously associating and discretizing two different environments. Analogous to Juhani Pallasmaa's description of edge in The Eyes of the Skin, the limitless potential of a spaceless border, between terra firma and aqua firm, is tolerated through the conscious, playing host to the human being

in an environment fundamentally at odds with the physiology of mankind; relating (humanity) with space and time. Pallasmaa uses architecture to define the edge between two environments, built context and the natural environment, in either case the *conceptual edge* between distinctly different environments influences the understanding of their shared dialogue.

"Architecture is our primary instrument in relating us with space and time, and giving these dimensions a human measure. It domesticates limitless space and endless time, the dialectics of external and internal space, physical and spiritual, material and mental, unconscious and conscious priorities concerning the senses as well as their relative roles and interactions, have an essential impact on the nature of the arts and architecture."

—Juhani *Pallasmaa, The Eyes of the Skin (p 19).*

Through Pallasmaa's definition, we simultaneously become aware of the *conceptual edge*, and the existence of the 'other' or anomalous environment of human inhabitation; aqua firma. The separation conceptual border fosters can be perceived as the ability to exist within one realm, discrete of the other. Mankind has exposed the characteristic embedded in consciousness through the idea of choice, choosing to acknowledge, or not, the connection with the other, suggesting mankind can exist within one system (terra firma), separate from the other (aqua firma). The lack of acknowledgment across the *conceptual edge* between differing environmental conditions can be seen through the impact mankind has exploited on the other. The choice of mankind to acknowledge, or not, the edge condition does not result in a dis-engagement of the two environments, contrarily an active dialogue exchanging energy and matter has historically existed and will persistently exist throughout time.

In a direct sense, aqua firma has fallen victim to the inability of mankind to understand the fluctuation and inter-connectedness of the 'edge' and the subsequent encroachment of one environmental condition onto/into the other. One of the most obvious and devastating effects of the fluctuating relationship of the edge condition comes in the form of the five floating trash gyres identified by The 5 Gyres Institute (located in the North and South Pacific ocean, North and South Atlantic ocean and the Indian ocean). In the case of humanity's existence of excess, the spaceless *conceptual edge* becomes a physical reality with global ramifications.

"The numbers are staggering: There are 5.25 trillion pieces of plastic debris in the ocean. Of that mass, 269,000 tons float on the surface, while some four billion plastic microfibers per square kilometer litter the deep sea."(Parker, L., Nat Geo 5.25 trillion)

The second definition of edge belongs to the undulating zone in which both land and water attempt a coexistence, creating a transitional environmental condition, of neither land nor water. The definition of the *transitional edge,* neither solely defined by terra firma nor by aqua firma, is embodied through spatial confine and the ability to host physical inhabitation. In contrast to the first definition presented, the *conceptual edge,* the defining characteristic of boundary between

Figure 1: April 1927 Flood of the Mississippi River, levee break, Greenville Mississippi, US. National Oceanic Atmospheric Administration

land and water is tied to spatial definition within this transitional environment. *Transitional edge* is found within the intermediate environment where terra firma and aqua firma own a constant dialogue of undulating and/or fluctuating existence, a continuous negotiation of coexistence. The physical presence of overlap, forces the acknowledgement of the physicality of edge when humans occupy the periphery of terra firma suited for the physiology of mankind. The two environmental conditions constantly impact the formal configuration of place, creating an environment defined through incessant spatial reconfiguration, impacting the local and global conditions. Within the *transitional edge*, survival is defined through abilities of adaptation to certain geological forces: attrition, corrasion, river meander, tidal flow, water deluge, and undulating water levels. Adversely, one can intend to control these geological forces and spatial reconfigurations, setting forth a divergent pair of ideologies.

Programmatically, human engagement in the *transitional edge* ranges from leisure, recreation, economics, politics, sustenance, transportation and inhabitation; describing a spectrum from desire to necessity. Historically, mankind's implementation methods for these various engagements is dominated by intentions of environmental control. Mark Twain's reference to the Military engineers in 1847 directly critiques the intention of control over the Mississippi River, in opposition to a symbiotic relationship rooted in a coexistence, one where the river's precedent for patterns of constant change is acknowledged. The engineer's intent centered on allowing human inhabitation to exist without suffering the impact of natural cycles, specific to the rising and lowering of the water's surface, the expanding and contracting of the river's channels and the ability of mankind to safely inhabit the waters

edge. The act of controlling the natural ecological systems and patterns, disregards the development of a dialogue of coexistence. The specific portion of the river in which the commission was tasked to control, or confine, was the edge; or *transitional edge.* The Commission's agenda was to address (control) the *transitional edge*, geographically defined by spatial reconfiguration and constant fluctuation, and collapse it into a conceptual border of spacelessness. A process disengaging the natural dialogue between the two environments, dividing terra firma from aqua firma. However, in either case, spacelessness or spatial definition, the existence is not defined by isolation or stasis of any form; the only existence of edge is negotiated through constant change and a continuous dialogue of exchange of energy and matter.

ECOLOGICAL AGENDA

The definition of terra firma and aqua firm as two systems, or environments that humans inhabit and negotiate through an edge, binds mankind to the landscape through cultural, economic, and societal relationships as described above. Historically, it is within this territorial edge human intervention has been focused. Examples of these interrelationships are at times expressed through rigid infrastructures, dense urbanisms, agrarian cultures, maritime pleasures; a list of varying relationships in a gradient of permanence. When mankind decided to inhabit this territory, a choice of control or coexistence with the environment and nature was exposed.

The notion of these varying relationships is not a recent development, however, one may propose the proposition of these relationships as landscape is a recent transformation of views, augmented by James Corner in the selected grouping of critical essays published in Recovering Landscape in 1997. The selected essays of Corner comes 150 years after Mark Twain identifies the tension arising as man continues large scale transformation of landscape. In Recovering Landscapes, the evolution of the traditional concept of landscape was proposed through association and alignment of principal themes: urbanism and infrastructure, strategic planning and speculations, culture and design. These essays set forth two important trajectories:

_ Environment is irrevocably bound to culture; i.e., nature and ecologies are not 'culture-less', instead, dependent with societal context.

_Landscape Agency- landscape not as a product of culture but an active agent enriching and producing culture.

Environment's irrevocable binding to culture pressures the dialogue between man and nature, a dialogue which holds certain impact on ecological construct. The coupling of environment to culture resulted in a shift: Landscape can no longer be conceived of as an isolated construct, a residual condition to be negotiated or an object to merely be acted upon, but instead landscape repositioned as a core tool to actively engage environment, linking of cultures, context and societies (a coexistence). The notion of landscape as an object and a design practice has continued to evolve, in Chris Reed and Nina-Marie Lister's Projective Ecologies, landscape is charged as an active agent through the lens of 'ecological thinking', acknowledging a certain responsibility between inhabitant and habitat.

It is within this reconstruction of the notion of ecology, the framework for a design agenda that engages both architectural artifacts, varying landforms, and infrastructural systems that navigate or form a dialogue between the two is founded.

_Ecology-the branch of biology that deals with the relations of organisms to one another and to their physical surroundings.

The adapted definition of ecology from the general scientific definition would include the idea of a greater collection of 'things' to produce a singular whole.

_Ecology-the branch of biology that deals with the relationship of organisms within a network or system to one another, other networks and the physical realm they inhabit.

The network of oceans, seas, lakes, aquifers and rivers, referred to as aqua firma, that dissect, disconnect and connect terra firma, can be understood in a basic sense as a singular ecology constructed from a set of diverse conditions and properties. The singular network of waterways can be understood as a changing set of conditions and properties while maintaining continuity. The clearest understanding of the singularity can be exposed by the varying physical properties of water while remaining a contiguous body; freshwater transitions into brackish condition and into saltwater. Through the lens of ecology, aqua firma and terra firma meld into one continuous ecology defined by the changing characteristics, conditions and properties exposed by a series of edge conditions identified through physical change.

The ecological understanding of the *conceptual edge* and the *transitional edge* with implication of cultural development has set forth the construction of inhabitation or possibly the man-made construction of ecological systems. The tools of engagement developed by mankind can be plotted between two extremes: tools of control and of coexistence. An analysis of these tools provides an indication to the trajectory specific to the development of local and global culture and civilization. Interrogating themes such as landscape, urbanism, (landscape urbanism), and infrastructure exposes intentionality of the toolsets developed by mankind, and questions the relationship between man and environment. Buoyant Clarity focuses attention on the infrastructural system of buoyage, specifically the historical development and agenda as it exists within the edge condition. Probing the buoy as an artifact, sheds light on scalar thinking, local to global understandings, the growth of communities to countries and the dialogue between mankind and environment.

The classification of two ecological agendas, one of Conservationist / Resourcist and another of Restorative, described in James Corner's Essay Ecology and Landscape as Agents of Creativity, offers a framework to evaluate the origins of the buoy, and to project its potential role in the environment it inhabits. A singular artifact, or buoy, viewed through the Conservationist/Resourcist Agenda represents a means of resource extraction and environmental destruction, while the same artifact is positioned through the Restorative Agenda with the role to provide guidance into humans understanding of the aquatic ecology. This agenda fosters relationships focused on

Figure 2: Harbour and Herring Fleet, Scarborough, Yorkshire. 1897 Royal Museums Greenwich

rehabilitation, environmental stewardship, and reconstruction. To reflect on these two ecological agendas, one finds dialogues in search of ecological balance, ecology as resource and performance, and ecological restoration. However, these dialogues fail to navigate environment's essential tie to cultural influence, evolving design agendas, and projective ecological strategies.

INTERROGATING THE BUOY

The continuous system of water (configured of oceans, seas, lakes, aquifers and rivers) generates a vast network operating as a connective tissue between all landmasses. The recognition of contiguous waterways and ease of transportation within, led to the desire of inhabiting the expansive network. The ever changing conditions of the water and the impact on the surrounding landmass adjacent to and below the water's surface required a certain knowledge of environmental conditions for the safe and productive navigation of the waterways. The *transitional edge*, defined as the coexistence of land and water is the alibi for mankind's intervention and inhabitance, the extension of our territory as humans in the form of terra firma into a foreign environment, aqua firma. The introduction of a marking and measuring artifact, to provide a safe dialogue of interaction between seafarer and aqua firma, specifically the edge condition, was inevitable.

Developed as a singular tool with means to expand the relationship between humans and the two environments, terra firm and aqua firma, first referenced in text in La Compasso de Navigare in the 13th century was buoyage or the buoy. In this 13th century reference, the buoy was positioned in the Guadalquivir River locating the approach to Sevilla, Spain*. (Marshall, Amy K, 2016) Initially conceived as a simple marker or port identification, the buoy offered a dialogue of way finding along the edge condition. The creation and subsequent development of buoyage owes it's beginnings to a fundamental need to decipher, decode and unfurl the specificity and complex workings of aqua firma. The buoy is an artifact unapologetically bound to performative criteria and necessity. The buoy as a singular artifact, or as a larger network of artifacts working in unison, frames a means by which humans have attempted to actively engage within environment. The buoy is charged with the task of extending the territory of mankind across the transitional zone of neither land nor water.

The ability to navigate aqua firma and the knowledge of its environment in relation to resource produced local economic, cultural, and

societal dependencies. These conditions shifted the history of the buoy from an artifact of shared knowledge to a coded device protecting the dissemination of knowledge held by aqua firma. The buoy noted in La Compasso de Navigare in the 13th century*, universally marked arrival to port. It acted as an open source object to the people arriving via vessel, representing an artifact of shared knowledge. The power of the waterways was uncovered by the cultures whose successful existence was associated with access to the expansive waterway network. These culture's often exploited their relationship or knowledge of aqua firma as a means to gain or expand a global presence. Seamen were dependent upon knowledge of the waterways as a means of economic prosperity and livelihood, the ability to understand how to inhabit and navigate became in and of itself a source of power. By the 15th Century, the system of buoys deployed by man, and or country, to map the specific characteristics became a direct reflection of knowledge and power. Around the 15th century King Henry VIII recognized the power associated with the developing buoyage infrastructure, documented with the creation and granting of a charter to minister the developing network of buoys*. With the dedication of resources to developing the network of buoyage, King Henry VIII quickly realized the buoy's ability to convey the embedded knowledge of the waterways allowed all of mankind access to the power of water navigation. It is at this point balance shifts from the infrastructure of buoy as shared knowledge or open source, to a coded record of the waterways only accessible to selected individuals.

'In 1514, King Henry VIII of England granted a charter to the Guild of Shipmen and Mariners to maintain aids in response to their petition that inexperienced individuals were endangering English shipping.' … The guild was also concerned about the "dangers of allowing foreigners to learn the secrets of the King's streams." 'The result of this charter (from King Henry VIII) was the creation of Trinity House. Another 70 years would elapse, however, until Trinity House earned the right to establish buoys and beacons- a right granted in 1594 by Queen Elizabeth I.' (Marshall, Amy K, 2016)

The swaying of the buoy across the line of open source network of knowledge to a coded infrastructural mapping system would continue into modern times with diminishing success. As new countries developed in uncharted lands, and efforts to 'discover' and 'identify' the global land and water system, the buoy was the primary tool established to identify passage or mark an area of great resource. As the United States of America established itself as a country in the 17th and 18th centuries, the buoy again was implemented as a tool to assist in the establishment of trade along the eastern coastal colonies, assisting the swift and safe foundation of the new American economy. Often the American [and global] buoy network represented inconsistencies of form, color, and size-a result of local dialects based on specificity of place and culture. Programmatically, the buoy's role expanded from a simple maritime marker of geological conditions to an eminent influencer of travel, trade, defense, and ultimately prosperity. To capitalize on the resource of the tool as a unified network, in 1848, the United States Government created a unification of the network of buoys which up until then was made up of a range of sizes, shapes and colors from port to port* lacking a clear and consistent language.

'The United States did not have a standard system of buoyage until 1848. Colors, shapes and sizes varied from port to port. This lack of regulation gave individual contractors free reign to decide the types of buoys necessary for a given area or harbor.' (Marshall, Amy K, 2016)

The United States unification plan of 1848 provided the groundwork for future initiatives in the developments of the buoy as artifact, through identification of form, color, patterns of color and artificial lighting (color and patterns of light). Historically, the lack of regulation allowed for groups of people to develop a specific language within the physical characteristics of buoys to code the information in which they were responsible, concurrently producing a local and global dialogue-often tied to local cultural traditions of trade, resource, and economy. The specificity of buoyage developed based on a vernacular understanding of place, defining a strong understanding of the ecological and environmental systems specific to a locale (aqua firma). The conglomeration of locally developed buoyage into a large system created global confusion, rendering the network ineffective.

The interest in a unification of buoyage becomes a global interest drawing together the League Of Nations in October of 1930 at the Conference of the Unification of Buoyage and Lighting of Coasts (Official No:C.163.M.58.1931.VIII). The interest in and importance of, a unified buoyage system was made clear in the general discussion by the Netherlands delegation.

'The Netherlands delegation which, at the same time, represented the Netherlands Indies and the other Netherlands colonies, was quite ready to cooperate loyally in all measures likely to put an end to the chaotic situation at present existing in maritime signalling.' (M. van Braam van Vloten, The Netherlands Delegation, page 24)

Mr. Putnam, the United States of America Delegate at the 1930 conference recognized the specialized development of buoyage across the globe while identifying the confusion the difference in buoy representation caused to clear communication.

'In the draft now submitted the provisions which concerned uniformity of aids to navigation only had been grouped under six heads, all brought into a single international buoyage and lighting system. The plan was much simpler than it might at first sight appear, as many features were optional to meet the needs of different parts of the world, and yet, in every case, these optional provisions fitted in logically and without giving rise to confusion.' (United States of America Delegation, Mr. Putnam, page 25)

The regulation specific to the physical characteristics, repositions the buoy as an open source artifact of knowledge to which it presently remains. Established design parameters pertain to physical characteristics, intended to unify the environmental characteristics distinct to the bodies of water the buoys are located within. The product is represented through an established range of diversity in sizes, shapes and materiality-each characteristics signifies a connection to program/function, locale (defined by culture or habit of place),

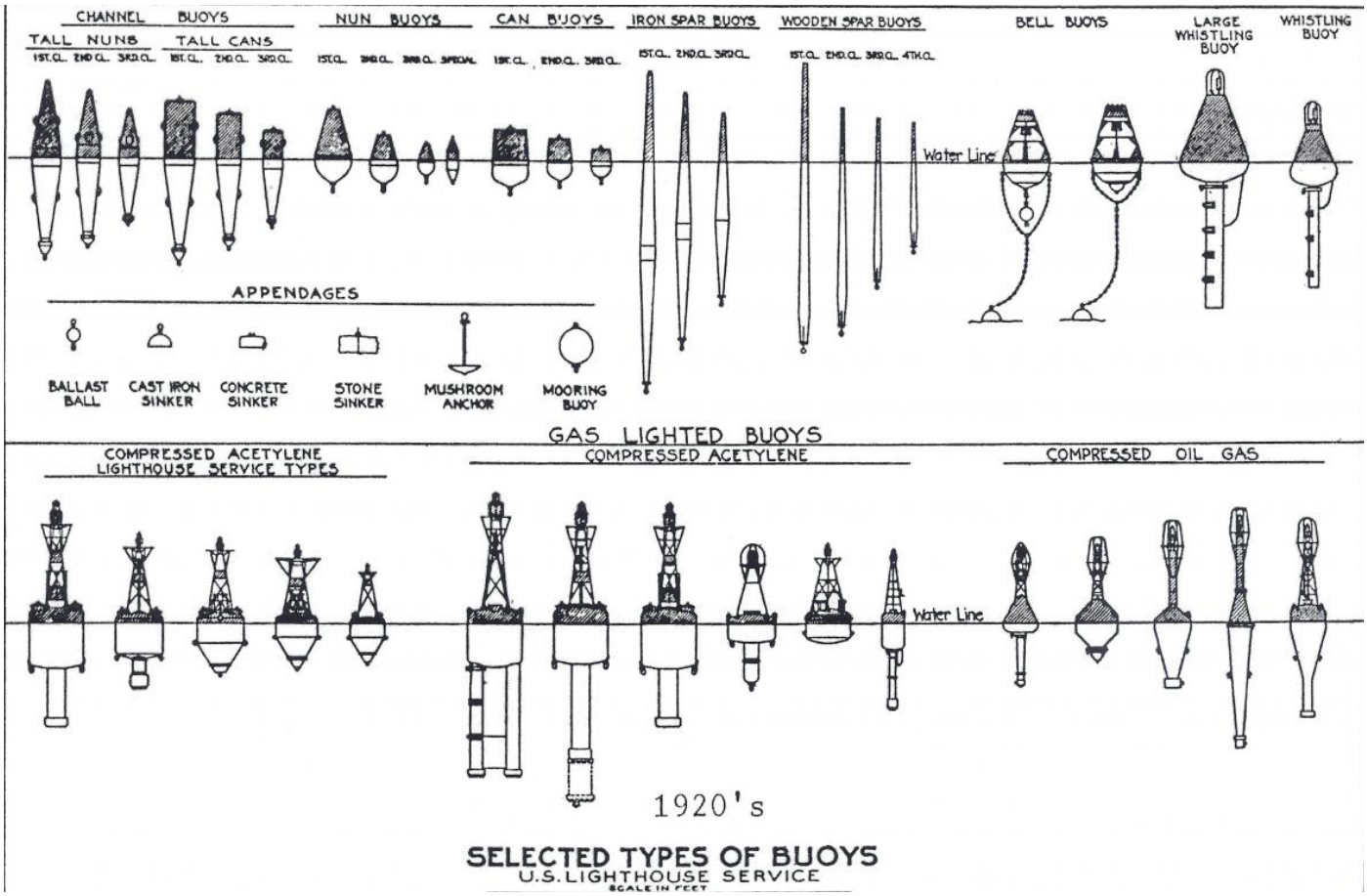

Figure 3: Selected Types of Buoys, U.S. Lighthouse Service 1920. U.S. Lighthouse Society (uslhs.org)

environmental conditions, and human interaction tied to a specific buoy within the now established, unified global system.

PROJECTIVE BUOYAGE

The buoy as an object developed out of need for way finding. A specific marker for local safe navigation. Local influences determined size, shape, material, and buoy articulation. As the network grew, it became normalized to support additional programmatic uses at a global scale: cross-cultural communication, weather mapping, geographical mapping, resource mapping and territorial marking. The development of global economic dependence for the transportation of goods and resources, coastal community establishments, and wartime engagements conspired to transform the evolution of buoys from small wooden casks, as a one-way communication tool into a vast network of intelligent scalar artifacts, (up to twelve meters in width,* Data Buoy Corporation Panel) that both mark, but also monitor, adapt, and often reveal information to the immediate environment and the people inhabiting it. James Corner's definition of ecological constructs Conservationist/Resourcist and Restorative, frames the range and intentionality in which the buoy developed; a means to extend the territory mankind can inhabit and foster dialogue.

Acknowledging the ecological agenda "is as much bound up in issues of social and economic power, demographics, and political struggles and engagement as it is operating in relationship to environmental forces." (Reed Lister page 15 quote from Felix Guattari of The Three Ecologies), the buoy becomes the translator of ecology. Navigating the *Transitional Edge* through an ecological lens of coexistence proposes a dialogue of stewardship, and re-frames the buoy as symbiotic mutualism-versus an anthropocentric tool of extraction and exploitation. In this context of landscape and territory, the tool in which concerns are made visible is, the buoy provides a voice for the past, current and projected state of existence. When investigating the dialogue between terra firma and aqua firma, the response is shaped through the singularity of ecological context: cultural conditions, environmental resource, and temporal strategies. Projective Buoyage refers to a gradient of permanence, extraction, and marking. The challenge lies in the understanding of symbiotic mutualism, and an exploration of ecological relationships. Buoyant Clarity does not intend to propose a 'solution' but to reshape an existing relationship; explored through ecological construct.

Submerged Being

As low lying island nations become engulfed by the rising sea, the once exposed inhabitable terra firma slowly becomes submerged, hidden below the water's surface out of sight but still deeply ingrained in the mind. The newly submerged terrain and history belonging to its settlements and cultures will be eroded by the persistence of the waters relentless currents and by the invasion of its new inhabitants. The rising of the sea-level in a basic sense claims the physicality of place, however, the space of being is taken from its inhabitants, rendering

Figure 4: Isle de Jean Charles. New York Times, Joah Haner

coastal civilizations as placeless. Marine life will stake claim in the newly available territory, eroding any trace of existence the now displaced people shared with the land, their ancestry and their culture.

What role do humans hold in marking and mapping the disappearing history the land holds, soon to be below the water's surface? Marine culture depends on the clear understanding of protruding subsurface terrain lurking just out of site for safe navigation of vessels along the surface of the water. Buoyage has long been used as a means of marking subsurface conditions as a means of communicating a safe passage within waterways, in a sense telling the story unfolding just below the surface of the water. As the sea reclaims the land belonging to specific civilizations, the opportunity to map the historical significance of these populations is now present. Using the language of buoyage, the people once belonging to the land, now submerged can communicate their past existence of place to the world, projected to the surface of the water.

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