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Taking Ocean Literacy Literally: Reflections on Literature's Influence on Ocean Literacy

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Abstract

Throughout history, literature has focused on humankind's complex relationship with the sea. Although culture, and literature in particular, has offered readers an opportunity to learn about and connect with the ocean realm when it comes to public engagement in marine planning, which is an opportunity to take part in the allocation of ocean resources, a majority of the public is often uninvolved and unconcerned. In this article, we reflect on portrayals of the sea in literary texts from three time periods: the mid-19th century (pre-World War I), the mid-20th century (post-World War II), and the 21st century (current times). We point out how ocean themes are of interest in parallel with important societal shifts, tensions, and "currents." Further, we contend that these popular literary works, or those considered canonical, contribute to ocean literacy today, as they likely did around the time of their publication. In today's world, exposure to literature that deals with the sea could lead to greater public engagement in ocean decision-making. The ability to make decisions about ocean resources is particularly important for ecosystem-based management, which is the basis for best practices in marine planning. As with many themes dealt with in many modes of culture (music, art, theatre, etc.), literary works can contribute to marine citizenship as manifested by greater public involvement in marine planning and (perhaps) greater protection of ocean resources.

Keywords

ecosystem-based management; literature; marine spatial planning; ocean literacy; public engagement; public knowledge; public participation

1. Introduction

The ocean is central to human health and culture. It offers many environmental benefits through ecosystem services such as atmospheric regulation and carbon sequestration, as well as through the provision of resources like food, oil, minerals, and space. These resources are a central part of life for coastal communities, where the ocean serves for recreation, fishing, and tourism. However, for today's society, ocean use often borders on exploitation and anthropogenically induced climate change threatens ocean ecosystem health (Brennan et al., 2019; Halpern et al., 2019; Stel, 2021). This is one of the reasons that marine spatial planning (MSP), "a public process of analyzing and allocating the spatial and temporal distribution of human activities in marine areas to achieve ecological, economic, and social objectives" (Ehler & Douvere, 2009, p. 18), has become the main approach to allocating and managing ocean uses over the past two decades (Tissière & Trouillet, 2022).

Marine planning is a public process because the sea is considered a common pool resource in most democratic countries of the industrial world (Turnipseed, Crowder, et al., 2009). Beyond ethical and legal purposes, public consultation in planning often ensures better outcomes. Research has shown that decisions are more likely to be successful when the public is involved in general urban and regional planning (Rijal, 2023). This has certainly been true for the designation and planning of marine protected areas, which aim to protect ecosystem function, habitats for endangered species, and marine biodiversity, and are often a major use designated through MSP (National Research Council, 2001; Vaughan & Agardy, 2020).

According to Ehler and Douvere's (2009) definition, MSP underscores the need for ocean literacy (OL). Among much of the public, there is a strong disconnect between understanding what goes on in the ocean, its importance to humankind, and recognition of the need to protect marine ecosystems (Jefferson et al., 2021). Furthermore, when it comes to public engagement in marine planning, the public may be disconnected, discouraged, and distrustful of government efforts to increase participatory planning (Flannery et al., 2018; Kelly et al., 2022).

For many years, humankind's complex relationship with the sea has been reflected in Western thought and culture (Döring & Winther, 2022). In particular, the portrayal of the sea in works of literature during the past two centuries, at least among Western-world cultures, has presented to the public concepts about the ocean they would most likely not have encountered otherwise. In this article, we acknowledge the central role of oceans in literature while addressing how recognition of this role could potentially contribute to, change, or influence OL, ultimately leading to greater public engagement in the planning and management of marine resources.

2. Framing and Defining OL

The concept of OL emerged as an offshoot of environmental literacy (Payne & Marrero, 2021); both environmental and OL are offshoots of science literacy. Science literacy is defined as the ability to understand science such that it can be used to address complex science-related societal issues (Howell & Brossard, 2021). Specifically, environmental literacy aims to influence human behavior in favor of preserving the natural environment (Uyarra & Borja, 2016) and includes the "understanding, skills, and motivation to make responsible decisions that consider one's relationship to natural systems, communities, and future generations" (Molloy et al., 2021, p. 42; Figure 1).

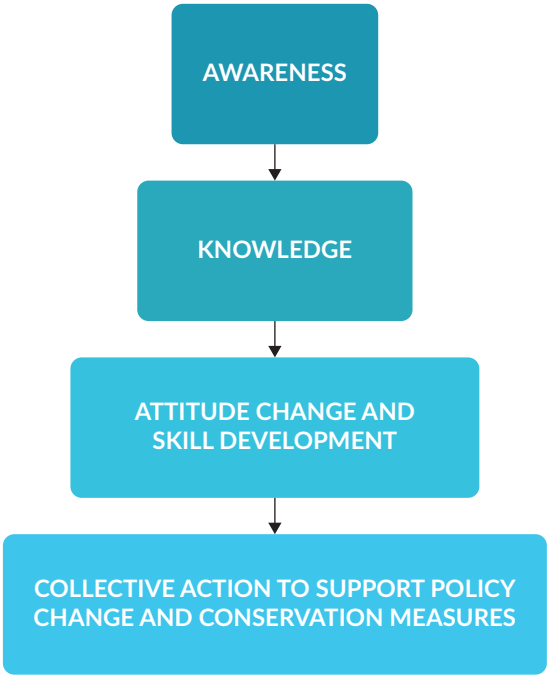

Figure 1. Flow chart depicting the result of each step in the environmental literacy process. Note: This figure is adapted from Molloy et al. (2021).

While environmental literacy was first acknowledged and defined in 1971, Brennan et al. (2019) claim that the term was only defined formally in 2004. OL has been defined as pertaining to "levels of public knowledge and informedness concerning oceans" (Steel et al., 2005, p. 97). It entails an "understanding of the importance of the ocean, the principles of how the ocean functions, and the interconnections between the ocean and people" (O'Halloran & Silver, 2022, p. 2). Further, an ocean-literate individual who possesses knowledge about the ocean uses this knowledge to make independent and important decisions about the ocean and its resources and can meaningfully communicate about these topics (Kopke et al., 2019; Schoedinger et al., 2010).

As knowledge of the ocean becomes more common and is depicted in accessible media and information sources, the general understanding of the value of our oceans, the functions oceans provide, and what constitutes healthy marine ecosystems improves. Studies have shown that OL is influenced by personal experiences, education level, age, gender, residency (urban vs. rural), and use of TV, internet, and radio (Steel et al., 2005; Steel & Weber, 2001). However, there is limited published research on the influence of literature (i.e., literary works including fiction, non-fiction, poetry, prose, etc.) on knowledge and familiarity with the ocean and its ecological importance.

A recent historical overview of the development of OL analyzes how it has led to more ocean-related research, especially across institutions and disciplines. However, while pointing out that the "scientific community" needs more exposure to OL (Paredes-Coral et al., 2021), the authors failed to examine the effect that exposure could have on the public at large, including those not engaged in marine education, science, or research. Similarly, Fernández Otero et al. (2019) highlight the importance of OL among maritime industry stakeholders, including present and future maritime workers. In general, however, the ocean lacks relevance to many people's everyday lives, leaving much of the public to conclude that the oceans are of little concern to them personally (Kelly et al., 2022).

Today, an important development is the extent to which ocean-related issues impact us in everyday life. One of the reasons this development is important is that an ocean-literate public is needed for marine planning. MSP is becoming more common among nation-states, regions, and even local jurisdictional entities—as evidenced by Directive 2014/89/EU (2014) of the European Parliament establishing a framework for MSP. In the US, Obama's Executive Order 13,547 (The White House, 2010) called for further development of coastal and marine spatial plans. Frazão Santos et al. (2014) predict that by 2030, half of the world's marine waters under national jurisdiction (i.e., exclusive economic zones according to the UN Convention of the Law of the Sea; Zacharias & Ardron, 2020) will be governed by marine plans. One of the first of these plans was already completed in 2009 (the Massachusetts Oceans Management Plan; Massachusetts Office of Coastal Zone Management, n.d.). The main outcome of these plans is the allocation of ocean resources—including space—for human activities. As the ocean and shores are common goods, the public should be involved in this allocation process. As mentioned, Ehler and Douvere's (2009) handbook on MSP defines it as a "public process." Thus, for better planning, for questions of equity and justice, and for true public processes to occur, an ocean-literate public is needed.

3. OL Timeline

In a 2016 article, Uyarra and Borja cite the first and only article on "marine literacy," the initial concept that laid the foundation for "OL," published in 1980 by Barbara Spector. This article summarizes efforts to "develop a nation of marine literate citizens" in order to improve public funding for marine-policy-related projects and the conservation of marine resources (Spector, 1980, p. 31). Spector (1980, p. 31) defines marine education as "general learning intended to impart marine literacy, so all citizens become aware of the potential for wise use of the marine…environment in their daily lives." She emphasizes the importance of marine education both through formal courses at every age and through community programs. Specifically, she suggests that educators focus on incorporating marine matters into curricula, with the goal of educating students, parents, and their communities (Spector, 1980). The tying of literacy to institutionalized education contributed to subsequent definitions of OL.

Since the early 2000s, OL has developed and progressed. The Ocean Project's (1999, p. 1) survey of 1,500 adults explored "the public's connections, values, attitudes, and knowledge relating to the oceans." Survey results suggested that Americans have "superficial" knowledge of the ocean. While acknowledging that oceans must be protected for humans to survive, for the most part, individuals do not understand how oceans benefit humans or how humans negatively impact ocean health (The Ocean Project, 1999). Subsequently, the Pew Oceans Commission (2003, p. 91) identified a need for "a new era of ocean literacy that links people to the marine environment." This followed the release of numerous studies indicating the serious decline of environmental conditions of oceans and coasts (McKinley et al., 2023; Steel et al., 2005).

In 2009, June 8th was established as the "World Oceans Day" for citizen science, ocean awareness, and educational activities (Stel, 2021). In 2010, educators and scientists established a definition of the ocean-literate individual characterized by an understanding of the ocean, responsible decision-making skills, and communication abilities (see Figure 2, second row) regarding ocean use and resources (Kopke et al., 2019). Similarly, the connection between society, culture, and oceans is acknowledged by the declaration of the UN Ocean Decade and Agenda 2030's sustainable development goals (SDGs), including "life below water" (SDG 14). These global initiatives require strong societal involvement to change humans' relation to

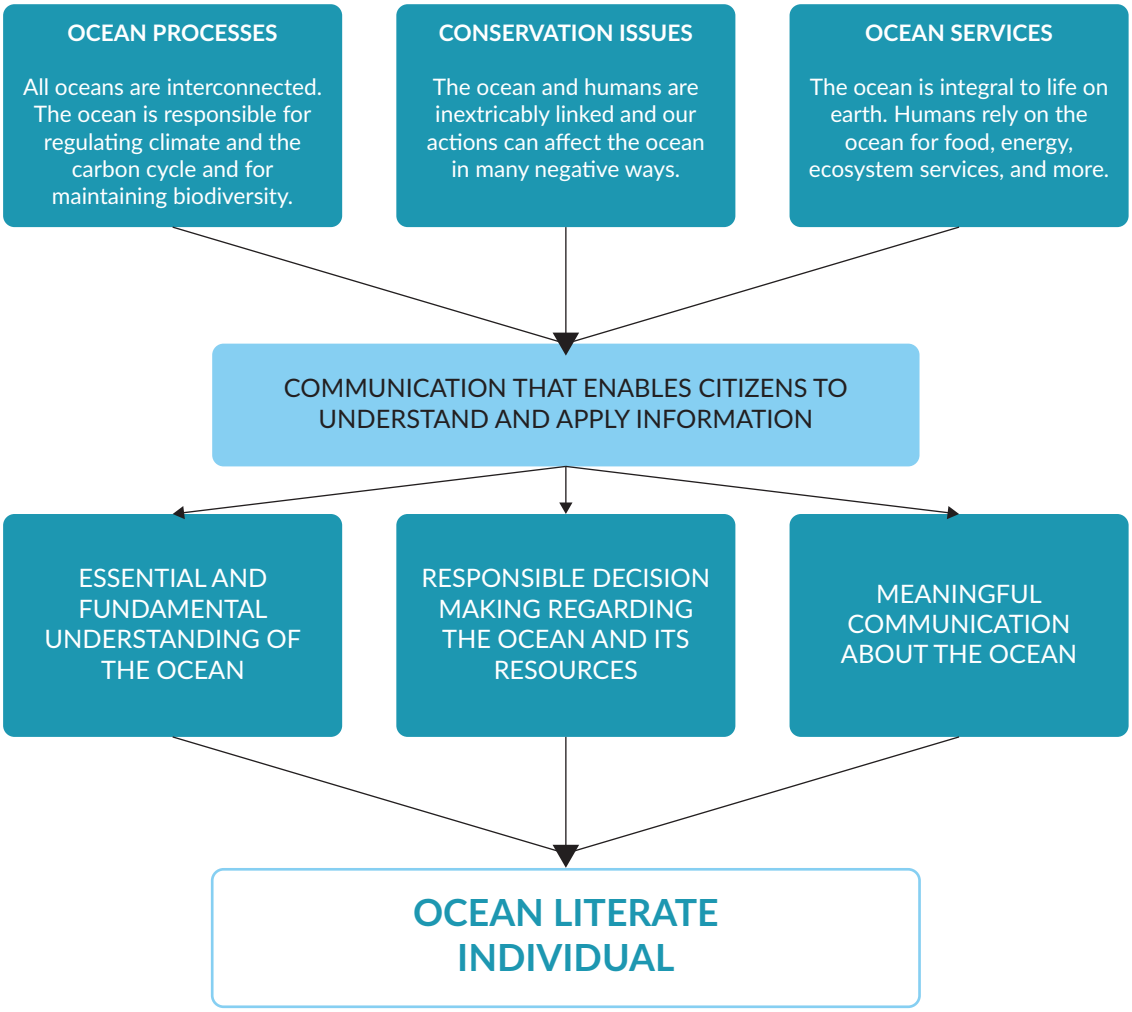

Figure 2. The OL development framework. Notes: This figure is adapted from Kopke et al. (2019); the top three boxes cover OL themes and the lower boxes describe what makes an individual ocean literate.

the ocean, for which literature could play an important role (Mentz, 2024; Omstedt, 2023; Omstedt & Gustavsson, 2022).

As the concept of literacy has been applied to new fields (e.g., education and planning), OL activities have broadened and expanded. Whereas the original definition of OL included knowledge, awareness, attitude, behavior, activism, and communication as basic goals (Brennan et al., 2019), recent framings of it propose adding emotional connections (emotional reaction to ocean-related issues), access and experience (physical or virtual accessibility to the ocean), adaptive capacity (capability to act in response to changing ocean conditions), and trust and transparency of information sources (McKinley et al., 2023).

While first developed for formal educational purposes focused on teaching OL in a one-way flow of information (UNESCO, n.d.), OL has more recently broadened to include action and engagement-based educational models that emphasize appealing to social norms and emotions, with the goal of inspiring changes in behavior and action (McKinley et al., 2023). Achievement of these goals could significantly improve public participation in ocean policy decisions and interest in sustainability.

4. OL and Public Engagement

OL allows individuals to influence and participate in public policy decisions about oceans (Steel et al., 2005) and can encourage and support citizen science data collection (Portman, 2016). OL can also "create societies that understand their interconnected relationship to the ocean, enhancing their ability to make informed and responsible decisions about marine resources" (Kopke et al., 2019, p. 2), and thus encourage stakeholders and the public to manage ocean resources and marine ecosystems sustainably.

Collective action informed by OL is necessary for both marine development and conservation. This idea holds for several reasons. Primarily, throughout the ages, resources of the sea—like other natural resources (e.g., air and navigable rivers), and particularly biogenic resources (e.g., wood, manure, and crude oil)—have been held in public trust. The public trust doctrine, incorporated by many regulatory systems, has roots in the English common law and before that in Roman law (Blumm & Wood, 2021). The doctrine is a powerful legal concept that obligates governments to manage natural resources, including the shores and the seas, for the benefit of their citizens (Turnipseed, Roady, et al., 2009). Therefore, it is essential that the public understand, communicate, and know about the sea.

5. OL Through Literature

Here, we examine societal connections to the ocean found in literary works of three eras. The books we chose to analyze represent widely read current literature or literary works canonized over the years since their publication inspired interest in and connection to the ocean among their readers. We contend that these popular literary works contribute to OL today, as they likely did—albeit to varying extents—around the time of their publication. This idea is linked to engagement-based models of education, particularly those related to emotional reactions and personal experience with ocean subjects as mentioned by McKinley et al. (2023) within the framework of OL.

We start with two works of literature from the mid-19th century, then highlight two exemplars from the mid-20th century, and culminate with two current books. For the most part, the literature we address in the first era (the mid-19th century) has relevance today due to its canonization over time. Melville's *Moby Dick*, which was not widely popular when first published, has become somewhat of a quintessential text as evidenced by the seemingly unending references to the work and its myriad messages, themes, and complexity (e.g., Edwards, 2006). In each of the three periods, the themes mentioned and identified in the literature we choose involve cultural concerns of the time, developed or evolving values, and distinct societal themes. While these literary works were popular or became so over the years since their publication, they also highlighted important major societal themes of their time (see Table 1). Today, as in the past, their authors expose readers to these themes, while also edifying about new horizons, primarily the unknown and unfamiliar ocean environment.

First, we consider Herman Melville's *Moby Dick* and Jules Verne's *Twenty Thousand Leagues Under the Sea*. Then we look at Rachel Carson's books on the marine environment as well as Ernest Hemingway's *The Old Man and the Sea*, both from the post-World War II era. In the contemporary era, we examine Wallace J. Nichols' *Blue Mind* and Lulu Miller's *Why Fish Don't Exist*. The impact of such works, both fiction and non-fiction, on readers, can be understood in relation to accepted societal norms and how the ocean is understood vis-à-vis society and the individual.

5.1. Period I: Mid-19th Century

Melville's *Moby Dick* (1851) brings, among others, the themes of (a) fear of the unknown and (b) man's struggle for dominance over nature juxtaposed with reverence towards it. The first theme is evoked as the whale itself symbolizes the sublime and unknowable, exemplified by Melville's description of "the unearthly conceit that Moby Dick was ubiquitous; that he had actually been encountered in opposite latitudes at…the same instant of time" (Melville, 1851, p. 148). This perception is indicative of the conception held at the time of the novel's publication (and in some circles today) of the ocean as limitless, signified by the omnipresence of the main character, the great white whale.

Melville's text also portrays the workings of the American whaling industry, which signifies man's intention to dominate nature. In this theme, the whale symbolizes the uncontrollable force of nature. Captain Ahab describes the whale as "that inscrutable thing…chiefly what I hate; and be the white whale agent, or be the white whale principal, I will wreak that hate upon him" (Melville, 1851, p. 131). This sentiment denotes the belief that humans existed against nature as a separate entity, a foreign one, and a force to be reckoned with. Still, the conclusion of the story invalidates this thinking—instead of accomplishing the goal of capturing the whale and thus defeating this opponent, "all collapsed, and the great shroud of the sea rolled on as it rolled five thousand years ago" (Melville, 1851, p. 459).

But some see in the conflict between the whaler (Ahab) and the whale (Moby Dick) the need for reverence of—and even compassion for—nature. In his essay, *Eight Ways of Looking at Samuel Beckett*, Nobel laureate in literature J. M. Coetzee contends that many things are missing from previous Nobel laureate Beckett's account of life, of which "the biggest is the whale" (Coetzee, 2018, p. 205). In explaining his view of Beckett, Coetzee quotes Melville's novel:

> "Captain Ahab, I have heard of Moby Dick," says Starbuck, the mate of the Pequod. "Was [it] not Moby Dick that took off thy leg?" Ahab answers, "Aye…it was…For that I'll chase that white whale…over all sides of the earth, till he spouts black blood and rolls fin out." But Starbuck is dubious and answers him "…vengeance on a dumb brute…that simply smote thee from blindest instinct. To be enraged with a dumb thing, Captain Ahab, seems blasphemous." (Melville, 1851, p. 80)

These aspects of the story echo the cultural themes of the time. A major event around this time was the emergence of two main schools of thought representing opposing attitudes toward the natural environment. During the mid-19th century, the tensions between John Muir's (1838–1914) preservationist movement and Gifford Pinchot's (1865–1946) conservationist movement were starting to gain momentum. The ideas that each advocated centered around whether humans should revere nature for its inherent value or manage it for exploitation. The latter idea rests on the domination of nature and its use, as needed, for humans (Caulfield, 1989).

In Jules Verne's *Twenty Thousand Leagues Under the Sea* (1869), we recognize themes of technological advancement and global cooperation. When the self-sufficient submarine powered by sea minerals emerges, the theme of technological advancement comes to light, especially as the suspicion that the creature is a submarine is initially dismissed; it was not technologically feasible at the time the novel was written. The awe with which the public in the story conceptualizes the submarine and its impressive construction also plays into this theme.

The theme of global cooperation comes to light with the discovery of the ship, which would not have been possible without the collaboration of experts from different countries, indicated by the mention of "the nations united against" Captain Nemo (Verne, 1869, p. 361). These themes represent developments in society at the time, including the rapid advancements of the Industrial Revolution and the beginning of worldwide international cooperation, eventually leading to the birth of the League of Nations following World War I (UN, n.d.). New technological advancements during this time, like the telegraph, steam engines, and railroads, allowed for the ease of communication and transport between the countries, which is highlighted in Verne's tale.

5.2. Period II: Mid-20th Century (Post-World War II)

Rachel Carson is most famous for her 1962 book, *Silent Spring*, which is considered one of the founding texts of the modern-age environmental movement. Three earlier works, *Under the Sea Wind* (1941), *The Sea Around Us* (1951), and *The Edge of the Sea* (1955), were also ground-breaking *New York Times* best-sellers, with the second staying atop the bestseller list for 39 weeks (Souder, 2012). All three explored sea and shore life. Specifically, we highlight two of Carson's themes from these publications: (a) Humans have a significant, often nefarious, impact on the environment, and (b) man is undeniably subordinate to and cannot fully know the sea.

The first theme emphasizes how humans impact the marine environment and calls for responsible stewardship and advocacy:

> The tragedy of the oceanic islands lies in the uniqueness, the irreplaceability of the species they have developed by the slow processes of the ages. In a reasonable world men would have treated these islands as precious possessions, as natural museums filled with beautiful and curious works of creation, valuable beyond price because nowhere in the world are they duplicated. (Carson, 1951, p. 95)

Here, Carson pays special attention to the changing climate, ostensibly being one of the first popular authors to address the concept (Blum, 2017). While she does not seem to recognize just how problematic the warming climate is, she does emphasize man's improper use of ocean resources. This displays a post-World War II shift from the previous era's themes of fear and uncertainty of the ocean, with inklings of the need to treat marine life with respect, perhaps echoing even Melville (see Starbuck's reaction to Captain Ahab's obsession with the whale in Section 5.1) and moving on to the outright novel idea of the need to preserve it.

Regarding the second theme, although efforts to apply new technologies to deep sea exploration at the time of these era's publications were numerous, the sea was (and still is) largely unknown and undiscovered. Carson notes that even revered ocean explorers were wrong about many of their observations. These ideas paved the way for conflicting views oscillating between acceptance of the urgent need for ocean stewardship and the view of the ocean as a provider of new resources for the technological age.

Like the two themes in Carson's works, Ernest Hemingway's *The Old Man and the Sea* (1952) highlights, on one hand, human reverence of nature and, on the other, man's struggle with it. This dichotomy is exemplified in the quote:

> You are killing me, fish, the old man thought. But you have a right to. Never have I seen a greater, or more beautiful, or a calmer or more noble thing than you, brother. Come on and kill me. I do not care who kills who. (Hemingway, 1952, p. 41)

The theme of respect for the ocean in Hemingway's novel is especially strong and consistent with the idea of stewardship mentioned above in the discussion of Carson's books. The juxtaposition of these opposing relationships between man and nature (e.g., the urge to "kill" the fish while also calling it "noble") is indicative of this era's transition from a feeling of trepidation towards the ocean to one of admiration. This highlights the conflict between stewardship and the provision of an important, exploitable resource, similar to what we mentioned in Section 5.1 concerning *Moby Dick*. Interestingly, assuaging these conflicts is an important goal of MSP (Ehler & Douvere, 2009, p. 57; Portman, 2016).

5.3. Period III: The Modern Age (21st Century)

Wallace J. Nichols' *Blue Mind* (2015) emphasizes individualism, a theme that is prominent in today's (Western-industrialized) society. Nichols claims, "water quiets all the noise, all the distractions, and connects you to your own thoughts" (Nichols, 2015, p. 267) and "when we tell stories of our own interactions with water we turn 'water' into a personal, individual experience" (Nichols, 2015, p. 260). He details many examples proving that interacting with the ocean improves mental and physical health. For example, he quotes a study that suggests that individuals in "coastal communities may attain better physical health due to the stress-reducing value of greater leisure time spent near the sea" (Nichols, 2015, p. 162).

In modern society, individualism, or "individualization," is a sociological idea that emphasizes the tendency of "individuals [to] increasingly become 'self-referential,'" focusing on the power of individual choices rather than coming together for purposes of collective action (Rasborg, 2017, p. 230). Nichols' central argument that interacting with water awakens and empowers the individual is followed by a warning against humans maintaining an "egocentric" relationship with nature, i.e., "see[ing] nature strictly from the perspective of what it can do for me personally" (Nichols, 2015, p. 250).

Further, Nichols balances the focus on the individual with a second theme of connectivity through water. "We are connected to each other, emotionally and biologically," he writes. "[Each blue marble, a physical representation of our planet] symbolizes the deep connection between people and this planet" (Nichols, 2015, pp. 274–275). In addition to balancing the first theme, the concept of connectivity counters the social phenomenon of aloneness. Early recognition of the current era's pervasive "aloneness" is emphasized in Robert Putnam's seminal work, *Bowling Alone* (2000). Putnam describes a distancing of Americans from community and social involvement and calls for a reorientation of American culture to a socially focused one. This includes recognition of "social capital" and a return to the benefits of connection with peers and unity with people from other backgrounds. The renewed connection with others that Nichols describes—a bond formed by interacting with water—can lead to greater connections at the individual and community levels. Nichols quotes Carl Sagan on this point: "[the pale blue dot of our planet] underscores our responsibility to deal more kindly with one another and to preserve and cherish the…only home we've ever known" (Nichols, 2015, p. 275).

In Lulu Miller's *Why Fish Don't Exist* (2019), like *Blue Mind*, we encounter themes of individuality, however, in the former, this theme appears with the theme of complexity. Miller retells scientist David Starr Jordan's life story in parallel to her own challenges in determining her own individual identity. Jordan (1851–1931), an ichthyologist by training, rose to fame due to his identifying and naming over 2,500 fish species. Individualism and complexity merge as Miller seeks to understand ponderings of the individual: "How lonely it can feel inside a head with ideas you can't figure out how to spit out" (Miller, 2019, p. 90). In describing the research challenges faced by Jordan, Miller notes in an interview with National Public Radio, "In anything we do we are looking for these proxies to parse the chaos" (Shapiro, 2020, para. 9). About science, she writes, "the work of good science is to try to peer beyond the 'convenient' lines we draw over nature…[and] know that in every organism at which you gaze, there is complexity you will never comprehend" (Miller, 2019, p. 162). These themes are consistent with contemporary concepts of breaking unexpected boundaries, navigating intricate political and social issues, and individualistic tendencies.

In addition to exploring themes of complexity parallel to coming to accept her own ambiguous sexual orientation, Miller reinforces new discoveries about marine wildlife. Despite the issues she has with Jordan's person, she recognizes him as "the swashbuckling giant of fish discovery" (Miller, 2019, p. 170). Still, her main point—and the reason for the alluring title *Why Fish Don't Exist*—is that the categorization of "fish" is merely a result of the human obsession with making things neat and tidy, with denying that life is inherently complex. But, alas, she concludes it is utterly meaningless. In fact, "many of the fishy-looking creatures swimming in the water are more closely related to mammals than to each other….'Fish' as a sound evolutionary category is totally bunk….Fish don't exist" (Miller, 2019, pp. 171–175).

As mentioned, throughout the book, Miller struggles to understand her own sexual orientation; for a time, she believed that she must be placed into a neat category. But, like fish, the category was meaningless and her own identity was far more complex. "A category," Miller writes, "is at best a proxy; at worst, a shackle" (Miller, 2019, p. 193). With her book, Miller ultimately makes a statement about chaos and the rejection of traditional categorization, which she reveals through the lens of Jordan's impressive feats in the world of fish identification, a major step in ocean discovery. Although Jordan was obsessed with taxonomy and overcame many setbacks in his attempts to name all fish, much of his work is invalid because fish never existed to begin with!

Table 1. Summary of the relevant themes found in the selected literature.

Period	Book	Theme 1	Theme 2
Period I: Mid-19th century	*Moby Dick* (1851)	Fear of the unknown	Man's dominance over nature
	Twenty Thousand Leagues Under the Sea (1869)	Technological advancements	Global cooperation
Period II: Mid-20th century (post-World War II)	*The Sea Around Us* (1951) *The Edge of the Sea* (1955)	Man cannot know the sea, despite what he may believe	Man's impact on the ocean/environment
	The Old Man and The Sea (1952)	Man's respect for nature	Man's struggle against nature
Period III: The Modern Age (21st century)	*Blue Mind* (2015)	Individualism	Connectivity
	Why Fish Don't Exist (2019)	Respect for individualism	Categorization challenged by complexity

6. Discussion

Exposure to literary works in popular culture has always impacted society's interest and understanding of the sea. Literature brings important lessons, facts, and general knowledge of the sea while appealing to large audiences of readers, listeners, and even viewers. This is especially true as literary works, even those of the distant past, are adapted for different media, particularly film. An example is *The Perfect Storm* by Sebastian Junger (1997), a non-fiction, journalistic account of the challenges faced by fisherfolk and their communities off the coast of New England, adapted for film in 2000.

With MSP becoming more prominent (Frazão Santos et al., 2019), increasing people's experiences with the ocean can encourage care of the marine environment, especially if they understand that what is described is threatened. Beyond learning about marine uses and the ocean's importance for providing ecosystem services to humans, readers of popular literature can better understand the purpose and need for healthy marine ecosystems.

While more research should be done on how to best take advantage of how literature has and will influence OL, we see three major implications. First, OL campaigns should consider reaching the public through all types of media, with a focus on not only teaching marine science but also fostering more general connections to the marine environment through culture and art. Second, arts and humanities should be incorporated into marine education materials and curricula. Third, more research is needed on how popular literature can teach, expose, and lead to a better understanding of the importance of the marine environment and its relevance to everyday life. The above points have been recognized by other scholars (e.g., *Introduction to Blue Humanities*; Mentz, 2024). Humanities, social sciences, life and natural sciences all have a role to play in the planning of marine space. The different disciplines that are currently called to come together, as in paradigms such as integrative marine planning and integrated coastal management, have in the past been siloed (Portman, 2016).

The implications resulting from this research should be considered along with the limitations of our study. We used neither the usual methods of literary study nor those typical of social science research. In the future, more systematic, rigorous methods could be applied to this topic for more comprehensive results. Also of note is that the works analyzed in this study represent mainstream imaginative engagement produced within and for a western-global north readership (e.g., Edwards, 2006). In the future, readership of other cultures and geographic regions should also be addressed.

Despite the limitations of our methods, they were effective for our exploratory research (Bhattacherjee, 2012). We choose important texts and their periods randomly as the "backdrop" of the social phenomenon of engagement in the political process and of space allocation in the marine environment. This selection approach was appropriate for this type of exploration and reflection. Our approach is neither an exhaustive review of literary criticisms, an analysis of literary studies, nor representative of all time periods since the mid-19th century. Rather, this study is among the first attempts to integrate typical marine social science topics, such as those frequently addressed in academic journals like *Marine Policy* and *Ocean and Coastal Management*, with those of the humanities. An important current topic of debate and discussion is how to achieve ecosystem-based management (EBM) through marine planning (Domínguez-Tejo et al., 2016; Jones et al., 2016; Trouillet & Jay, 2021) and to this discussion, we hope to have contributed.

7. The Importance of Healthy Marine Ecosystems

The ecosystem-based approach is invariably relied on as a foundation of MSP (Directive 2014/89/EU, 2014). The application of this approach is anchored in the EU's Integrated Maritime Policy, which depends on EBM to achieve "sustainable development of seas and oceans" (Directive 2008/56/EC, 2008). Defined as "an integrated approach to management that considers the entire ecosystem, including humans" (McLeod et al., 2005, p. 1; Portman, 2016), EBM focuses on managing human activities that impact the ocean and coastal environment in a way that maintains the health and resilience of the ecosystem and the services it provides (Directive 2014/89/EU, 2014; Ehler & Douvere, 2009; Frazão Santos et al., 2014; Mengerink et al., 2009).

This concept of ecosystem health is paramount to successful MSP, a process that requires the engagement of "multiple actors and stakeholders at various governmental and societal levels" (Olsen et al., 2014, p. 1), especially due to the "public" nature of the sea (Chalastani et al., 2021; Frazão Santos et al., 2019). Furthermore, many marine scientists decry the tension between EBM (or environmentally sustainable planning) and blue growth (Frazão Santos et al., 2014; Leslie & McLeod, 2007; Zuercher et al., 2022), defined as "smart, sustainable and inclusive economic and employment growth from the oceans, seas and coasts" (Sekimizu, 2012, para. 8) as both are promoted in marine plans (Jones et al., 2016). There is increasing emphasis on the expansion of maritime sectors of the economy with blue growth. At the same time, EBM is called for as the foundation of marine planning efforts (see previous paragraph).

Public engagement in terrestrial planning involves the allocation of space in cities, communities, and even large tracts of open space (such as national parks and agricultural lands) almost always geographically near to those engaged. In addition to the physical distances between marine environments and the public, issues of ownership and belonging in the marine realm are usually vague (Agardy, 2000). Scholars on MSP have found that the geographic scale and location of members of the public can be a determinant of engagement in a marine planning process; those living in coastal communities may be more likely to participate than those living inland (Tissière & Trouillet, 2022; Zaucha & Kreiner, 2021).

In a comparative study of 16 marine spatial plans, Collie et al. (2013) found that although stakeholders' roles were generally clearly defined in these plans, they did not participate in all stages of the planning process. A more recent study found that "in Europe and probably beyond, the future of the MSP system is still largely linked to its capacity to foster forms of participation that would not be mere procedural artefacts" (Tissière & Trouillet, 2022, p. 28). While research is needed on why participation in marine planning often wanes (Zaucha & Kreiner, 2021), distance, unfamiliarity, and lack of knowledge about how the sea affects civil society could be factors.

As mentioned, marine space is one of the most salient types of public domain (Leslie & McLeod, 2007; Portman, 2006; Turnipseed, Roady, et al., 2009), often referred to as the "ocean commons" (Braverman, 2022). Therefore, research is needed focusing on the management of human uses of the sea according to the EBM approach using public sector planning paradigms. One of these planning paradigms is collaborative planning, which, like participatory planning used in EBM, emphasizes the participation of stakeholders and the general public. For example, research on how participants from indigenous societies might lead to better marine planning outcomes is needed (Tissière & Trouillet, 2022; Vierros et al., 2020). Marine spatial plans that incorporate

important principles of planning theory related to the planning of public commons will likely be better at successfully implementing meaningful EBM.

Here we contend that the combined influence of structured OL efforts (such as those mentioned in Boaventura et al., 2021; Brennan et al., 2019; and Guest et al., 2015) and literary works that deal with the sea and all its complexities can encourage a broad range of stakeholders to engage in marine planning. Literary scholars and marine activists, planners, and oceanographers may be coming together as evidenced by current and relatively new studies such as Mentz (2024) and Omstedt and Gustavsson (2022). More specifically, marine planning programs should consider the contributions of the arts and humanities to marine social science and marine education. Literature portrays the ocean in creative, interesting, and culturally relevant ways. Literature may be unique in its ability to educate readers, broaden horizons, and draw in readers through plot, narrative, and subtle messaging. It has contributed and continues to contribute to OL.

Due to the widespread exposure of the populace to the literature we mention, increased knowledge of and appreciation for the sea is achieved even by works having other non-marine-related messages for society. The societal themes communicated in them could bring people figuratively closer to the ocean and increase their concern with it. Lastly, since we are terrestrial beings and the threats to our oceans are so great, every opportunity to inculcate various aspects of the marine environment should be recognized and encouraged. Such connections could lead to caring for the marine environment, improve public engagement in what goes on in the sea, and expand links between oceans and society.

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Conflict of Interests

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