Fisheries in the News: How the Media Sets the Agenda for Seafood Sustainability in the United States

by

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ABSTRACT

The media is a powerful force in shaping public discussions about marine issues. Many people lack first-hand experiences and direct sources of information about fisheries topics, so they rely heavily on the information presented to them in the news. Thus, the media has the potential to influence public agendas based on their selective coverage of topics, which primes people to take certain information into account when making decisions. This study examines the contents of 412 newspaper articles from five national newspapers to determine which topics are receiving the most coverage and how they are being communicated to the public. The analysis considers fisheries and seafood discussions overall, as well as focusing on the three most commonly consumed seafood items in the United States: salmon, shrimp, and tuna. Systematic coding of newspaper articles shows that economic and social fisheries concerns are emphasized more than environmental concerns. Additionally, fisheries articles tend to be emphasize the importance of fishermen's livelihoods, the dangers of international seafood trade, the economic utility of fish, and a consumer's right to make informed decisions about seafood. Overall, there are a number of conflicts and weaknesses in the media's coverage of fisheries, which would likely make it challenging for Americans to make informed, sustainability-minded decisions about seafood purchases and fisheries policies.

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TABLE OF CONTENTS

Page

CHAPTER Page

LIST OF TABLES

Table Page

Table Page

INTRODUCTION

Global fisheries are facing a number of serious problems, most notably the rapid depletion of fisheries stocks. A total of 90.1% of fisheries are either overfished (28.8%) or being fished at maximum capacity (61.3%), which has worrying implications for the sustainability of our food supplies and marine ecosystems (FAO, 2014). Aside from the impacts on fish populations, the process of catching fish from the wild poses additional threats to marine systems. Some large-scale fishing methods, such as trawling for shrimp, destroy ecosystems on the ocean floor. Fishing nets and cages often have high levels of bycatch, which means that fishermen are accidentally catching and killing animals besides the target fish (Monterey Bay Aquarium, 2011).

Additionally, governing ocean fisheries is difficult due to our lack of knowledge about marine ecosystems and the difficulty of monitoring fishermen on the high seas. Due to inadequate enforcement on international waters, fishermen often catch more fish and bycatch than they report, which leads to difficulties in estimating current fish populations for conservation purposes (Clover, 2006). One alternative to wild catches is aquaculture, or fish farming, which is becoming increasingly popular. Currently, 66.6 tons of fish are produced globally via aquaculture, while 91.3 tons are wild-caught (FAO, 2014). Although aquaculture has the potential to feed a growing world population in the face of dwindling seafood supplies, it has its own sustainability problems, including pollution, intensive use of resources, and potential interbreeding of domestic stocks with wild stocks (Monterey Bay Aquarium, 2011).

Though scientists are well aware of these issues, the American public has low awareness of fisheries challenges (Steel et al., 2005a), which impairs people's ability to

make sustainable seafood choices and support sustainable fisheries policies. If we are to get Americans to address fisheries issues, we need to first get them on the public agenda. Many Americans receive their information about marine topics from the news media (Hicks et al., 2008; McCallum, Hammond, & Covello, 1991; Steel et al., 2005b), so it is important to know what these sources are saying. Therefore, this research characterizes the major themes and characteristics of the media's fisheries agenda.

The public is a powerful entity in the fisheries sustainability movement because consumer demand is the major driver of overfishing. According to the Food and Agriculture Organization of the United Nations (FAO) 2014 report, approximately 86.2% of all fish caught or farmed are for human consumption. The amount of fish used as food has increased by an average rate of 3.2% per year for the past five decades, which outpaces the global population growth rate of 1.6%. Per capita fish consumption is also on the rise, currently averaging 19.2 kilograms worldwide, which is up from 9.9 kilograms in the 1960s and 17.6 kilograms in 2007. In the U.S. specifically, per capita consumption is at 21.7 kilograms (National Marine Fisheries Service, 2015) and has been growing for a number of years. This rise in demand means that consumers have great potential to speak with their dollars and insist that seafood be caught in a sustainable manner.

Harnessing the power of public opinion can be a powerful tool in promoting policy change. In the past, changes in public opinion have been driven by increased media coverage of environmental issues, which has subsequently facilitated the adoption of policies to address these issues. For example, the media played a large role in making the public aware of the health concerns associated with the toxic waste in the Love Canal

neighborhood of New York, and "its framing of the story of a classic David-and-Goliath tale attracted the sympathy of the national public" (Layzer, 2012). This in turn put pressure on the national government to enact policies to mitigate the problem. In the 1970s, extensive newspaper coverage of Earth Day demonstrations around the nation increased public awareness of water and air pollution issues, which helped create a favorable political environment for passing the Clean Air and Clean Water acts (Layzer, 2012). Thus, the media has the potential to increase public awareness and set a social agenda for seafood choices and the sustainability of fisheries, but more work must be done to understand the current media dialogue and how these issues have been framed to the public.

Some studies have examined media framing of specific fisheries issues (Amberg & Hall, 2008; Bodony, 2014) and the effects of media on other environmental behaviors and perceptions (Kalaitzandonakes et al., 2004; Yadavalli & Jones, 2014); however, no research (to my knowledge) has examined the overall characteristics of seafood sustainability coverage in newspapers. Since so many people obtain information through the media in general (Hicks et al., 2008) and newspapers in particular (Barthel, 2014), understanding how major national news sources discuss fisheries sustainability can help to identify the topics that are likely to be most salient to the American public. Additionally, this type of work can identify potential weaknesses in communication, so that fisheries interest groups can refocus their outreach efforts on topics that need more attention from the public, or attempt to clarify potentially confusing messages.

This research is based on the theory of agenda setting in the media, which suggests that the topics most frequently covered in the media will also be the most salient

in the minds of the public (McCombs, 2014). The media "may not be successful much of the time in telling people what to think, but it is stunningly successful in telling its readers what to think about" (Cohen, 1963). This is especially true of issues that people are incapable of observing directly, such as environmental issues, because their only source of information on the topic is second-hand. For example, many Americans cannot directly observe a turtle getting caught in a fishing net, but they still may come to understand this problem through hearing about it via other channels. McCombs (2014) had it right when he claimed that: "For nearly all of the concerns on the public agenda, citizens deal with a second-hand reality, a reality that is structured about journalists' reports about these events and situations."

An *agenda* in this study refers to the collection of topics and their relative importance to one other. In this research, I characterize the media's fisheries agenda by looking at the prevalence of different topics and how these topics are communicated. Understanding the media agenda around fisheries is important because humans do not make decisions based on the objective reality of our environment. Rather, we understand the world through our *perception* of what reality is, which is constructed by the information we absorb and the feelings we have about this information. For example, many Americans would not understand deforestation in Brazil as a problem if they were only taking cues from their environment because we are so physically disconnected from the problem that we cannot directly observe it. Therefore, the problem of deforestation exists in our minds only because we receive information about it from another source. This idea of information transfer highlights the importance of communication; without the extensive communication channels we have now, our perceptions of reality would

only encompass that which we can directly experience. But because we have the ability to learn about problems in far-off places, they become a part of our reality.

This research project focuses on an environment – the ocean – that many people are quite physically disconnected with, and attempts to understand the reality that we are constructing about it through the media, because this constructed reality is the context in which people make decisions about issues facing the ocean. It is important to understand this context because the public has the power to influence fisheries conservation issues by reducing pressures on marine ecosystems through their seafood choices, advocating for management which supports and restores marine ecosystems, and supporting Marine Protected Areas and other key marine conservation tools and policies.

In order to understand the media agenda surrounding fisheries and seafood sustainability, I chose to use newspapers as my source of data and to systematically code them for the topics they cover. Because newspapers are a prominent source of information for many people, and because mass media coverage of topics can affect social and political change, it is valuable to understand what newspapers are saying about seafood sustainability. Possessing detailed knowledge about the way the media talks about seafood can help policymakers, activists, and reporters consider how they might alter their communication strategies to make consumers more aware of fisheries issues and solutions.

In addition to conducting a broad examination of fisheries and seafood conversations in general, I will focus on the three most popular seafood species in the United States: shrimp, salmon, and tuna (National Marine Fisheries Service, 2013). I chose to look at specific types of fish because sustainability issues are not the same for all

fish, but differ based on the unique context of each fishery. These three species in particular were chosen because they are the most commonly consumed species in the United States, which means that they are likely to be more frequently covered in the media. Additionally, because of their popularity, changes to American consumption patterns and policies regarding these three fish are likely to result in the greatest sustainability impacts.

The following chapters will: develop my rationale and strategies behind this project, report the results from my coding of 412 newspaper articles, and then synthesize the coding results to highlight major trends and themes in the communication of seafood sustainability in the media. The "Literature Review" chapter summarizes previous research about where the public gets their information about fisheries, explores the agenda setting capacity of the media, and summarizes major fisheries concerns as identified by scientific reports. The "Research Design" chapter then explains the rationale behind my research questions, data collection and coding procedures, and data analysis strategies. The "Results" chapter summarizes the content of the dataset to develop a portrait of the media agenda on fisheries. Finally, the "Discussion and Conclusion" chapter analyzes the sustainability implications of the media agenda, suggests useful applications of this information, and discusses the limitations of this study and opportunities for further research.

LITERATURE REVIEW

In this chapter, I discuss the public's current level of knowledge regarding fisheries issues and justify the importance of newspapers in the dispersal of fisheries information. I then explain the agenda-setting capacity of the media, or in other words, the media's ability to influence the public agenda. From there, I describe major fisheries issues, looking at both overall concerns about fisheries sustainability and concerns specific to my three species of focus – shrimp, salmon, and tuna – and examine commonalities and differences between them. Throughout this thesis, I refer to "sustainable" fisheries, which I define as fishing practices that take into account the long-term health of ocean ecosystems, commercially-harvested species, and people who are dependent on fisheries for sustenance or their livelihoods (modified from a definition provided in the FAO State of World Fisheries and Aquaculture Report, 2014).

The Relationship between the Media and the Public

This section examines how the media and the public interact to understand fisheries issues, by first looking at what the public currently knows about fisheries and then discussing how the media shapes environmental discourse.

Public Knowledge about Fisheries

The public has low familiarity with fisheries science and terminology (Steel et al., 2005a), which is concerning because many studies have linked knowledge with support for environmental policies (Beierle & Cayford, 2002; McAvoy, 1999). Eagly & Kulesa (1997) argue that:

> … communications directed to the general public are important not only because they may influence public opinion, and therefore have an impact on public policy, but also because they are potentially effective in inducing individuals to engage in behavior that can lessen the destructive impact of humans on the environment.

If we want the American public to be engaged in making policies that promote fisheries conservation, they must have greater awareness of the unsustainable nature of many fisheries and seafood production. Additionally, they should be aware of the complexities of these issues and have the ability to balance multiple concerns and perspectives.

Research to date has examined two different ways that citizens engage with fisheries issues by examining: 1) their support for fisheries policies, and 2) their decisions about which seafood to purchase. High levels of knowledge about fisheries issues has been correlated with greater support for policies that promote fisheries and marine conservation:

> …respondents with higher levels of knowledge are significantly more likely to report ocean fisheries are in decline or serious decline and that they support moderate to significant changes in current ocean resource management policy. (Steel et al., 2005b)

Although research has looked at *how much* knowledge people have about fisheries, research is needed on the communication channels through which people receive fisheries information, so that we can understand how particular forums—such as the mass media—frames sustainability problems and, thus, sets the public agenda.

When it comes to sustainable seafood choices, most consumers do not prioritize environmental concerns when choosing which fish to purchase (Oken et al., 2012). They also have low levels of knowledge about consumer tools that can facilitate sustainable seafood choices, such as ecolabels and seafood guides (Hicks, Pivarnik, & McDermott, 2008). Even when people do have knowledge about the environmental impacts of their

food choices, they are more influenced by other factors (Almeida et al., 2015), such as health concerns (Oken et al., 2012; Lando & Labiner-Wolfe, 2007), price (Horgen & Brownell, 2002; Verbeke & Vackier, 2005), and social and cultural norms (Tuu et al., 2008; Verbeke and Vackier, 2005).

These findings suggest two important things regarding communication about seafood. First, people need to be made aware of the resources available to them, such as sustainable seafood guides and ecolabels, so that they can utilize them to make more sustainable seafood purchases. Second, seafood sustainability issues need to be made more salient in people's minds. These tasks can be achieved through more careful consideration of how the media agenda is shaping the public agenda and how the framing of fisheries topics might impact public reception.

The Media as a Source of Information

The lack of knowledge amongst Americans about fisheries policy and sustainable seafood highlight the need for better information dissemination on the topics. The media has proven to be an especially influential source of scientific and environmental information for the general public (American Press Institute, 2014; Hargraves et al., 2004), which is why I have chosen to examine the current media dialogue surrounding fisheries issues. The media is the most popular source for seafood and fisheries information in particular (Hicks et al., 2008), and newspapers are the most popular media source of written information for marine and environmental issues (McCallum, Hammond, & Covello, 1991; Steel et al., 2005b).

This high level of reliance on the media as a source of information about marine and environmental issues is consistent with current statistics on media preferences across

all topics. Newspapers are still an important and widely-utilized source of information for many Americans, with a recent study finding that 66% of Americans cite newspapers as a source of news that they accessed in the past week, which was the third most popular news source after local TV news and national network news (American Press Institute, 2014). As the dominant source of written news information, newspapers are likely to influence consumer perceptions of seafood issues. Additionally, because social media websites (e.g. Facebook, Twitter) often link to newspaper articles, it is likely that online newspapers are continuing to receive a wide audience.

Numerous studies have shown that mass media coverage can influence the information that reaches the public (Boykoff & Rajan, 2007; Wilson, 1995), impact public understanding and perception of environmental issues, and even change people's habits (Kalaitzandonakes et al., 2004; Villela-Vila & Cost-Font, 2008; Yadavalli & Jones, 2014). The ability of the media to control the dissemination of information is of particular interest to seafood sustainability, which is a complex and multi-faceted issue wherein making an informed decision about purchasing fish requires knowledge of a product's fishing or farming (aquaculture) methods, marine ecology, and country of origin, among other details. If the media can influence consumer behavior in regards to other environmental issues, it can potentially influence how Americans choose to purchase seafood or support fisheries policies. Newspaper reading has also been shown to have stronger positive correlations with policy-relevant knowledge about fisheries than other media sources (Steel et al., 2005b), which suggests that newspapers might also improve the ability of citizens to participate in their government in an informed way regarding fisheries policies.

A lack of first-hand experience and more direct sources of knowledge will strengthen peoples' reliance on the media as a source of information (Ader, 1995; Soroka, 2002). Since 61% of the United States population lives inland (National Marine Fisheries Service, 2015), a large percentage of Americans will not find marine and fisheries issues as relevant to their lives or communities, and they may not understand the economic, environmental, and political concerns surrounding fisheries. Additionally, their experiences with seafood production are likely to be limited, so their reliance on the media as a source of information is probably relatively high. Taken together, all of these factors – the popularity of newspapers, the media's capacity to influence individual behavior, and humanity's physical disconnection from the sea – suggest that newspapers may be a valuable tool for shaping discussions about fisheries sustainability.

Understanding the News Media

This section examines the news media's potential to influence what the public thinks about through its agenda setting and priming capacities, then considers how these stories can be shaped and framed to emphasize different aspects and perspectives.

Agenda Setting and Priming

Part of the media's power is its ability to determine what information the public receives and how they will interpret it (Scheufele, 2007). *Agenda setting* refers to what information the news media organizations choose to cover. The media's selective emphasis on certain topics is significant because it influences which issues are deemed important by the general public (Althaus & Tewksbury, 2007; McCombs & Shaw, 1972). Agenda setting also contributes to *priming*, which is when coverage of a particular topic changes the weight of importance people attach to it (Miller & Krosnick, 2000). This

means that issues frequently covered by the media will be more readily accessible in people's minds, and thus, people are more likely to take those issues into account when making decisions. Essentially, the media has the power to define and construct environmental issues, because "problems do not become recognized or defined by society as problems by some simple objective existence, but only when someone makes claims in public about them" (Hansen, 2010). As a major source of information about environmental issues, the stories the media chooses to cover will likely have a significant impact on how we define and understand seafood sustainability problems.

The media's agenda-setting power has been examined through comparisons of media to public agendas (using content analyses and public opinion surveys, respectively), to determine whether media coverage of a topic impacts public concern for a topic. Many studies have indeed found linkages between increased media coverage and elevated public concern, especially when dealing with "unobtrusive" issues that readers would have little direct experience with or access to (Ader, 1995; Brosius & Kepplinger, 1990; Yin 1999). Because the public generally has little direct experience or information about seafood (Hicks et al., 2008; Olson et al., 2014), then the media agenda should have a particularly strong impact on the public agenda concerning seafood sustainability.

Agenda-setting research encompasses four different research perspectives based on the intersections of two dimensions. First, researchers may choose to focus on either the entire media agenda or on a specific item on the agenda. Second, researchers may focus on either aggregate data (which evaluates the agendas of an entire group or population) or individual data (focusing on one person's response) (McCombs, 2014). My research examines a broad set of issues across a large corpus of text, which:

"provides useful, comprehensive descriptions of the rich, ever-changing mix of news media content and public opinion at particular points in time. This perspective strives to understand the world as it is." (McCombs 2014) This method has been described as "the ultimate goal of agenda-setting theory" (McCombs 2014). Thus, my project attempts to illuminate the entire media agenda surrounding fisheries issues so that we can understand which particular topics the public might find most salient.

There are also three different levels of agenda setting: first-level, which looks at the salience of objects; second-level, which looks at the salience of attributes; and third-level, which examines relationships between first and second-level agenda-setting and considers the influence of journalistic elements (such as writing style or sources of information) on salience (McCombs, 2014). An *object* refers to a particular topic, such as salmon farming, and an *attribute* refers to a characteristic of the object. In salmon farming, for example, different attributes might include: dangers from pollution of the natural environment, health risks to consumers, or the benefits of providing food more efficiently. A focusing event, such as a major disease outbreak or environmental catastrophe, may also be an attribute that contributes to a topic's salience. This study examines both first- and second-level agenda setting, because I am looking at the diversity of objects covered in newspapers as well as the different attributes of these objects.

Selection of Stories

The agenda-setting function of the media arises from the reality that the media cannot cover every topic, and must necessarily make decisions about which stories to report on. The stories that tend to make it into newspapers are event-driven, have

immediate relevance, and are supported by powerful interest groups. Additionally, they tend to reinforce existing power structures rather than challenging the status quo (Hansen, 2010).

Major events such as extreme weather events or publications of major reports, or topics that are "rare, novel, vivid, and dramatic" (Amberg & Hall, 2008), tend to make it into the news more than more than long, slow processes such as climate change or pollution-related health issues (Hansen, 2010). Big events make issues immediately salient to readers, and are also bound within a closed, specific time period, which is easier for people to comprehend. The media, along with interest groups who are promoting a particular claim, will often latch onto these events to bring attention to issues that aren't so immediately salient (Ungar, 1992). Fisheries depletion and the destruction of ocean habitats are slower processes that are difficult for people to see and understand because they take place over a longer period of time. Because long-term issues are often less salient to readers, these conversations would probably benefit from piggybacking onto news stories about big events, such as oil spills or health reports, which tie into long-term fishery sustainability issues. Additionally, news stories are more likely to focus on the negative aspects (Amberg & Hall, 2008) or contested opinions (Compas et al., 2007) surrounding an issue than on positive aspects or benefits, so it is likely that fisheries articles in newspapers will highlight problems and risks.

The changing nature of journalism has also impacted the stories that are covered in newspapers. In the past, journalists tracked down their own stories, but today, many journalists conduct most of their research from their desks. They no longer need to pursue stories to cover, because organizations will contact them about issues they think should

be included in the news (Hansen, 1994; Smith, 1992). In the fisheries world, these interest groups could include fishermen, fish production businesses (e.g., food processors and marketers), conservation groups, and government entities. This means that groups with significant resources to garner publicity, and those who are better connected with reporters, are the ones who will have their stories covered more often. Because the groups with power and money are able to get their voices published, the media often unwittingly reinforces the existing power structure (Hansen, 2010). Although many journalists attempt to avoid overly biased sources:

> …pressures on journalists to increase productivity, via substantive growths in the pagination of national newspapers across the last two decades, achieved with relatively static numbers of journalists...have prompted desk-bound journalists to develop an increasing reliance on pre-packaged sources of news deriving from the PR industry and news agencies (Lewis et al., 2008, 1).

This means that reporters are becoming more passive in their selection of stories, and rely heavily on information coming from outside sources to determine what to report on.

Additionally, journalists are often assigned to particular "beats" or topics that they cover frequently. To facilitate their ongoing research on a particular topic, journalists tend to form symbiotic, interdependent relationships with a few known, reliable sources, who consistently provide information on specific topics and, in return, get their voices heard by the media (Hansen, 2004; Nelkin, 1995). While aspects of this system make reporters' jobs easier, it means that the information reaching the public is likely biased and incomplete.

Framing of Stories

Another way that the media shapes stories is through *framing*. Entman (2007) defines framing as a "process of culling a few elements of perceived reality and

assembling a narrative that highlights connections among them to promote a particular interpretation." A frame typically uses a number of components to shape the discussion in certain ways, including: problem definition, causal interpretation, moral evaluation, and suggested solutions (Entman, 2003). In general, a frame is constructed through selection and salience. Selection is similar to agenda setting, in that it is the process of presenting certain pieces of information while withholding others. Salience promotes particular interpretations or understandings of an issue through emphasis on particular causes, values, and solutions (Hansen, 2010).

Previous research has shown that the media may frame environmental issues in a number of ways. The stories may have negative or positive tones (Amberg & Hall, 2008; Lockie, 2006), emphasize certain risks over others (Bodony, 2014; Muter et al., 2013), emphasize sacrifice or motivation (Gifford & Comeau, 2011), or appeal to specific values (Corbett, 1995; Feinberg & Willer, 2013; Kareiva, 2014; Reese, 2013; Schultz & Zelezny, 2003). Additionally, stories may have an emphasis frame, which focuses the story on who is being affected by a problem. For example, the same story might be framed as impacting either property, wildlife, or human health, all of which might have different influences on the reader (MacInnis et al., 2013). If people are learning about environmental issues through the media, it is important to understand how these problems are being framed and how this influences the public discussion. This knowledge can be utilized to affect environmental conversations and fisheries management in the future.

Reporters can shape stories and frames through their selection of sources. The media chooses which sources to cite to support their stories, and these sources can have an influence on how the stories are received by the public. The more trustworthy and

knowledgeable the public deems the source, the more persuasive their message will be (MacInnis et al., 2013). There has been some research to suggest that scientists, scholars, doctors, and environmental groups are more widely trusted than religious leaders, business or industry figures, and government officials (McCallum, Hammond, & Covello, 1991; McInnis et al. 2015). However, a number of studies have found that government officials tend to be the most-cited source of information in news stories about the environment (Brown et al., 1987; Culbertson, 1975; Hackett, 1985). This may be because these sources are the most accessible and because reporters recognize government officials as legitimate since they are "recognizable, credible, and have status" (Corbett 2006). This suggests a potential disconnect between the sources to which the public would respond most positively and the sources that are actually utilized in environmental news stories. Additionally, who is quoted in an article tends to be correlated with how an issue is framed or defined (Hansen, 2010). The sources chosen to provide information in a news article can therefore play a large role in shaping the story being told.

Sustainability Issues in Fisheries

This section outlines current seafood and fisheries sustainability issues as identified by five major sources: 1) the Food and Agriculture Organization of the United Nations' 2014 report, "The State of the World's Fisheries", 2) National Oceanic and Atmospheric Administration's 2014 report, "Fisheries of the United States", and 3) Seafood Watch's 2011 report, "Turning the Tide: The State of Seafood", 4) Monterey Bay Aquarium's Seafood Watch program, and 5) the International Seafood Sustainability Foundation's 2016 report. These sources were chosen because they are comprehensive

reports from well-respected organizations that synthesize a diversity of scientific information. The purpose of this section is to establish a set of sustainability concerns that have been widely agreed upon by the research and scientific community, so that I can search for the presence of these issues in the media.

Global fisheries are being harvested at unsustainable levels, yet people continue to consume greater amounts of fish every year. In 2011, 28.8% of fish stocks were being overfished and 61.3% were fully fished, which means that only 9.9% of stocks were underfished (FAO, 2014). At the same time, food fish supply has been increasing at a rate of 3.2% per year over the past five decades (FAO, 2014), which means we are overfishing stocks while continuing to increase our fishing efforts. Despite these pressures on wild fish stocks, global per capita fish consumption has increased from an average of 9.9 kg in the 1960s to 19.2 kg in 2012 (FAO, 2014). Aquaculture has been growing to meet some of this demand, producing an all-time high of 66.6 million tons of fish in 2012, which accounted for about 42% of total fish production that year (FAO, 2014). However, "over the last half-century, dramatic increases in farmed seafood have allowed global seafood consumption to increase despite the decline in wild-capture fish" (Monterey Bay Aquarium, 2011), suggesting that agriculture may be masking the decline of wild fish populations and facilitating unsustainable consumption habits.

In addition to overfishing, a number of other factors impact the health of the marine environment and thus the health of fish, including: pollution, coastal development, manmade climate change, and ocean acidification. Coastal development converts land from valuable ecosystems, such as estuaries and wetlands, into human settlements that contribute more pollution to the ocean. Pollution – including urban and

agricultural runoff, the burning of fossil fuels, and oil spills – degrades ecosystems and diminishes their ability to replenish overexploited fish stocks (Monterey Bay Aquarium, 2011). Global climate change alters sea surface temperatures, causes sea level rises, and contributes to the acidification of the ocean, all of which modifies ocean habitats and makes them potentially inhospitable to some marine life. Although the full impacts of climate change are still unclear, they are expected to be substantial (Monterey Bay Aquarium, 2011).

Inadequate management and regulation continue to be major concerns in addressing all of these problems and maintaining the health of global fish populations, and the FAO states that "poor governance is perhaps the main threat to the sector's ability to satisfy future demand for fish" (FAO, 2014). Problems that need to be better addressed include: overfishing; illegal and unreported catches; traceability in the food supply chain; bycatches and discarded fish; and management of the high seas beyond exclusive economic zones. Overfishing not only depletes the targeted species, but also can also have a cascading effect through ecosystems and affect other marine life. Strong catch limits are a start, but management practices also need to shift from looking at individual species to considering entire ecosystems (Monterey Bay Aquarium, 2011). Additionally, scientists estimate that illegal and unreported fishing account for up to one-fifth of total global fisheries production (Monterey Bay Aquarium, 2011), so regulatory capacity should increase to allow for better enforcement of fisheries restrictions. Another issue is the lack of traceability in the food system. It can be difficult to keep track of where and how fish is produced, which limits the ability of buyers to choose sustainably harvested

seafood (FAO, 2014). Until all of these management concerns are addressed, it will be difficult for fish populations to recover (FAO, 2014).

Recommended management solutions to the problems of overfishing, illegal catches, pollution, and climate change are similar, because all of these problems are interrelated. Ecosystem-based management, which takes into account entire ecosystems instead of single species, should be implemented. Similarly, catch limits should be based on rigorous scientific assessments and take a precautionary approach of setting relatively low catch limits. Marine protected areas are another important management tool that can protect especially valuable or vulnerable places and allow entire ecosystems to recover (Monterey Bay Aquarium, 2009). Stakeholder participation in planning and implementation of management initiatives and adaptive management that allows for continual adjustment to changing situations should also be incorporated into fisheries management plans (FAO, 2014).

Seafood is an important economic commodity worldwide, especially for developing nations. Employment in the fisheries sector continues to grow around the globe, and in 2012 there were 58.3 million people working in fisheries and aquaculture. Asian workers accounted for 84% of all people employed in the sector overall and 96% of the people employed in aquaculture specifically. African workers made up the next largest group, accounting for 10% of all employees in the fisheries sector. North America is the only region that has seen declines in the number of fishermen and fish farmers over the past decade (FAO, 2014).

In addition to providing jobs, fish is a highly traded commodity on the global market, with 200 countries exporting fish and fish products in 2012. It accounts for

approximately 10% of total agricultural exports around the globe. Developing countries' share in the global market has been rising, and they currently account for 54% of global exports by value and 60% by live weight (FAO, 2014). American imports of both edible and nonedible fishery products have being growing steadily over the past decade, and the U.S. saw an 11.8% increase in value and a 1% increase in quantity of edible fishery imports from 2013 to 2014 (National Marine Fisheries Service, 2015). Asian countries provided 60% of U.S. imports in 2014, and one-third of the value of edible imports came from shrimp (National Marine Fisheries Service, 2015).

Although fish supply and demand are both increasing, this is largely due to fishermen moving from overfished to underfished stocks (FAO, 2014). As the percentage of underfished stocks dwindles, the potential for future a gap between supply and demand increases. Two methods of increasing fish supply without increased landings are heavier investment in aquaculture and reducing post-harvest losses from current production. There are three types of losses: physical (fish not used after capture or harvest, including bycatch and discards), quality (products are spoiled or damaged), and market force (market reactions impact success of fish products) (FAO, 2014).

Fish is such a popular commodity in part because of its perceived health benefits. The U.S. Food and Drug Administration (FDA) recommends fish as "an important part of a healthy diet", because it is a good source of protein, low in saturated fat, contains omega-3 fatty acids, and can contribute to heart health and proper child development. The FDA does note, however, that some species contain high levels of mercury that is particularly worrisome for children and pregnant women; as such, they suggest avoiding shark, swordfish, king mackerel, and tilefish (Food and Drug Administration, 2014).

Outside of the United States, fish is an important source of protein for many people, especially in developing areas of the world. The FAO describes the importance of fish in global diets:

> A portion of 150 g of fish can provide about 50–60 percent of an adult's daily protein requirements. In 2010, fish accounted for 16.7 percent of the global population's intake of animal protein and 6.5 percent of all protein consumed. Moreover, fish provided more than 2.9 billion people with almost 20 percent of their intake of animal protein, and 4.3 billion people with about 15 percent of such protein. Fish proteins can represent a crucial nutritional component in some densely populated countries where total protein intake levels may be low. (FAO, 2014)

Therefore, ceasing to fish entirely is not a viable sustainability option, because human health is an important consideration that needs to be balanced with environmental health.

While these topics give us an idea of the broad, overarching considerations in fisheries sustainability, different species face different challenges. The following sections describe the concerns facing shrimp, salmon, and tuna.

Table 1
Economic Sustainability Issues in Fisheries

Scientific concerns	Description	Suggested solutions
Jobs & livelihoods	Commercial landings by U.S. fishermen down, both by tonnage and value[3]	Catch share programs[2]
Trade	Import value of fishery products up 8%, export value up 3%[3]	End perverse subsidies[2]
Supply-demand gap	Wild fish populations are decreasing, global demand for fish is increasing[1]	Aquaculture, reduce post-harvest losses[1]

[1]FAO State of World Fisheries and Aquaculture, 2014 [2]Seafood Watch State of the World's Fisheries, 2009
[3] National Marine Fisheries Service, 2015

Table 2
Environmental Sustainability Issues in Fisheries

Scientific concerns	Description	Suggested solutions
Declining fish populations	Commercially important species are being depleted[2]	Catch limits, ecosystem-based management, marine protected areas, end perverse subsidies, tools for sustainable consumer choices, consumer seafood sustainability tools [2]
Decreased marine biodiversity	Other animals, such as sharks, whales, birds, and turtles, are in decline due to changing ecosystems or bycatch[2]	Marine protected areas[2]
Bycatch and discards	Discarding fish that aren't marketable (discards) or accidentally catching animals that aren't the target species (bycatch)[2]	Build regulatory capacity to reduce bycatch and discards[1], switch to more selective fishing methods, consumer seafood sustainability tools [2]
Invasive species	Can displace native species; most commonly from international shipping and aquaculture[2]	Ecosystem-based management[2]
Pollution and coastal development	Oil spills, urban runoff, agricultural waste, fossil fuels, and coastal land conversion all contribute to decreased ecosystem productivity, making it more difficult for fish stocks to replenish[2]	Ecosystem-based management[2]
Habitat damage from fishing gear	Some fishing methods destroy habitats and upset communities on the ocean floor[2]	Adoption of less damaging fishing methods; marine protected areas; consumer seafood sustainability tools[2]
Climate change and ocean acidification	Makes ocean more inhospitable to animals; likely alters the ocean's natural cycles[2]	Ecosystem-based management[2]
Impacts of aquaculture	Pollution, escaped fish impacted wild ecosystems, resource-intensive feed (fishmeal); nearly half of world seafood from aquaculture	International standards and certification systems[1], appropriate siting of fish farms, monitoring of wastewater, alternative feeds[2]

[1]FAO State of World Fisheries and Aquaculture, 2014 [2]Seafood Watch State of the World's Fisheries, 2009
[3]National Marine Fisheries Service, 2015

Table 3
Social and Political Sustainability Issues in Fisheries

Scientific concerns	Description	Suggested solutions
Inadequate management	"Main threat" to fisheries; illegal/unreported catches, overfishing[1]	Stakeholder participation, adaptive management[1], science-based management, marine protected areas, catch shares, ecosystem-based management[2]
Traceability in the food system	Accurate tracking and labeling of seafood as it goes from ocean to consumers	Improved certification of products and processes[1]
Contaminants in seafood	Human health may be endangered by toxins such as mercury, radiation poisoning, pesticides, and industrial chemicals[2]	Consumers should reduce consumption of large predatory fish, such as tuna and shark[2]
Health benefits of seafood	Seafood provides a good source of protein and omega-3s	People should include fish in their diets

[1]FAO State of World Fisheries and Aquaculture, 2014 [2]Seafood Watch State of the World's Fisheries, 2009
[3] National Marine Fisheries Service, 2015

Shrimp

In 2014 Americans ate an average of 4 pounds of shrimp per person, making it the most popular seafood in the United States (National Marine Fisheries Service, 2014). However, 90% of the shrimp consumed in the U.S. is imported (SeafoodWatch.org), primarily from India, Indonesia, Ecuador, Vietnam, Thailand, and China. In 2014, U.S. imported 1.3 billion pounds of shrimp worth $6.7 billion, which is an increase of 138.8 million pounds from 2013. The energy and resources necessary to ship shrimp overseas has worrying environmental implications, and sourcing shrimp cheaply from foreign countries can have a negative economic impact on American shrimp fishermen.

American shrimpers try to compete, but they produced only 295.3 million pounds of shrimp valued at $681.4 million in 2014, which is a 4% increase from 2013 but significantly less than the quantity of imported shrimp. The Gulf of Mexico region accounted for nearly 63% of these domestic landings of shrimp, although their total

production was down 6% from 2013. The other important shrimping regions in the United States – New England, South Atlantic, and Pacific – all saw increased shrimp landings in 2014 (National Marine Fisheries Service, 2015).

Table 4
Shrimp Sustainability Issues

Scientific concerns	Description	Suggested solutions
Jobs and livelihoods	American fishermen threatened by competition from imported shrimp[3]	Americans should consume more domestic shrimp
Imports	90% of our shrimp is imported, which threatens U.S. fishermen and uses a lot of resources and energy[3]	Americans should consume more domestic shrimp
Habitat destruction	Trawling destroys the seafloor; siting of farms on the coast destroys valuable habitat[4]	Adoption of more discriminate fishing methods[2]
Bycatch	Trawling produces high amounts of bycatch[4]	Adoption of more discriminate fishing methods[2]
Human rights violations	Slave labor in Asian farms[4]	Americans should consume more domestic shrimp
Impacts of aquaculture	Waste runoff to oceans, uncertainty about the safety and impacts of antibiotics, destruction of vital habitats such as mangrove forests[4]	International standards and certification systems[1], appropriate siting of fish farms, monitoring of wastewater, alternative feeds[2]
Illegal fishing	Some locations, such as Mexico, have high incidences of illegal catch[4]	Consumers should avoid species that are commonly caught illegally[4]
Wild stock declines	Some species, such as the whiteleg shrimp in Mexico and both pink and white shrimp in the Gulf of Mexico, are overdepeleted[4]	Consumers should avoid species that are experiencing overdepletion[4]

[1]FAO State of World Fisheries and Aquaculture, 2014 [2]Seafood Watch State of the World's Fisheries, 2009
[3]National Marine Fisheries Service, 2015 [4]Seafood Watch website [5]ISSF report 2016

There are sustainability challenges with both farmed and wild-caught shrimp. With farmed shrimp, concerns include: waste being released from farm ponds to the environment, uncertainty about the safety and impacts of antibiotics, and the destruction of vital habitats such as mangrove forests. Additionally, there have been social justice

concerns surrounding the use of slave labor to work in Asian shrimp farms, especially in Thailand (Sylwester, 2014). Wild-caught shrimp can be problematic because of high incidences of bycatch and the damage to habitats from fishing equipment. Trawling, which is when a net is dragged behind a boat across the ocean floor, is a popular way to catch shrimp but also damages the seafloor and produces high levels of bycatch. In fact, "shrimp trawl fisheries represent just two percent of the global fish catch but are responsible for more than one-third of the world's bycatch" (Monterey Bay Aquarium, 2011).

Salmon

Salmon is the second most popular seafood in the United States, with Americans eating an average of 2.3 pounds of salmon per capita in 2014 (National Marine Fisheries Service, 2014). There are a number of subspecies of salmon that are consumed in the United States, including: Atlantic, chinook, coho, sockeye, pink, and chum. The latter five species are found in the Pacific, primarily Alaska (95%), Washington, California, and Oregon. U.S. commercial landings of Pacific salmon in 2014 weighed approximately 720.2 million pounds and were valued at $616.7 million, which is a 33% decrease in pounds and an 18% decrease in value from 2013 (National Marine Fisheries Service, 2014). Sustainability concerns about Pacific salmon include threats to endangered stocks, unacceptable levels of bycatch, and habitat destruction caused by indiscriminate fishing methods (Seafood Watch, 2016).

Americans also consume a lot of farmed salmon. In the United States, Atlantic salmon are the leading species of farmed finfish, contributing 42 million pounds of salmon valued at $105 million to the U.S. market in 2014 (National Marine Fisheries

Service, 2014). There are environmental concerns with farmed salmon, specifically those farmed in net pens that are open to the ocean, including: chemical use, escaped salmon breeding with wild salmon, and disease transmissions between farmed and wild salmon.

In November 2015, the FDA approved AquAdvantage genetically-modified (GMO) salmon for the U.S. marketplace, which has caused some concern among consumers and environmental groups. The major environmental concern is the potential impact of GMO salmon on wild salmon, including genetic contamination, a negative impact on biodiversity, and potential unpredictable effects on the environment (Le Curieux-Belfond et al., 2009). However, the FDA asserts that they have sufficient regulations to address the concerns of escaped salmon, requiring that GMO salmon producers abide by strict physical, geographic, and biological containment strategies to avoid mixing wild and modified salmon (Food and Drug Administration, 2015). There are also concerns about how genetically modified salmon might impact human health. These concerns are primarily due to the uncertainty of altering the genes, with the fear that "the transgenic organism produces a new substance or an anticipated substance at higher concentration, compared to the non-transgenic equivalent species; this could therefore result in allergenic or toxic characteristics" (Le Curieux-Belfond et al., 2009).

Salmon is commonly thought to be a healthy species of fish to eat. The FDA's seafood recommendations specifically list salmon as a good choice for American consumers, in part because salmon is low in mercury (Food and Drug Administration, 2015).

Table 5
Salmon Sustainability Issues

Scientific concerns	Description	Suggested solutions
Impacts of aquaculture	Chemical use, escaped salmon breeding with wild salmon, and disease transmissions	International standards and certification systems[1], appropriate siting of fish farms, monitoring of wastewater, alternative feeds[2]
Wild stock declines	Some populations, such as Chinook from Washington and Coho from the Columbia River, are threatened[4]	Consumers should avoid overfished species[4]
Habitat damage	Wild salmon habitats may be damaged by aquaculture or other human activities[4]	Ecosystem-based management[2]
Health benefits	Eating salmon is considered part of a healthy diet	People should consume salmon

[1]FAO State of World Fisheries and Aquaculture, 2014 [2]Seafood Watch State of the World's Fisheries, 2009
[3]National Marine Fisheries Service, 2015 [4]Seafood Watch website [5]ISSF report 2016

Tuna

Canned tuna, which is typically albacore tuna, is the third most popular seafood in the United States, with Americans eating an average of 2.3 pounds per capita in 2014 (National Marine Fisheries Service, 2014). Total landings of all species of tuna by U.S. fishermen in 2014 were 702.4 million pounds with a value of $573.1 million, which is a 15% increase in pounds but an 18% decrease in value from 2013 (National Marine Fisheries Service, 2014). However, on the international market, tuna continues to fetch very high prices, which contributes to the high demand that has led some species to overexploitation.

Several species of tuna are being severely overfished. The Southern Bluefin Tuna is listed as "critically endangered" by the IUCN Red List, the Atlantic Bluefin tuna is listed as "endangered", and the Bigeye Tuna and Pacific Bluefin Tuna are listed as "vulnerable". (IUCN Red List, 2015). The International Seafood Sustainability Foundation estimated that 39% of global tuna stocks were being overfished and 13%

were at risk (ISSF, 2016). Certain fishing methods also have high levels of bycatch, with dolphins, sea turtles, seabirds, sharks, and endangered tuna species being of particular concern (Seafood Watch, 2016).

Because tuna are highly migratory species that occupy international waters, they are managed through cooperation by a number of nations. There are five regional fisheries management organizations: the Commission for the Conservation of Southern Bluefin Tuna, the Inter-American Tropical Tuna Commission, the International Commission for the Conservation of Atlantic Tunas, the Indian Ocean Tuna Commission, and the Western and Central Pacific Fisheries Commission. Despite the presence of these international bodies, many species of tuna on Seafood Watch's "Avoid" list mention a lack of effective management as a reason for their poor listing, explaining that: "in international waters, there are no effective measures to help populations recover and reduce bycatch" (Seafood Watch, 2016).

Table 6
Tuna Sustainability Issues

Scientific concerns	Description	Suggested solutions
Wild stock declines	52% of global stocks overfished or at risk[5]	Consumer should avoid overfished species[4]
Contaminants	May have high levels mercury and other contaminants[4]	People should eat other fish instead, especially pregnant women and children
Bycatch	Fishing methods result in high bycatch of dolphins, sharks, turtles, and other animals[4]	Adoption of more discriminate fishing methods[2], ecolabels to alert consumers of bycatch[4]
Management and regulation	Difficult to manage because they are international, migratory species[4]	Stakeholder participation, adaptive management[1], science-based management, marine protected areas, catch shares, ecosystem-based management[2]

[1]FAO State of World Fisheries and Aquaculture, 2014 [2]Seafood Watch State of the World's Fisheries, 2009
[3]National Marine Fisheries Service, 2015 [4]Seafood Watch website [5]ISSF report 2016

Tuna is the most common source of mercury in the American diet (Consumer Reports, 2011), which is a cause for consumer concern. Because they are high on the food chain and eat a lot of smaller fish, they accumulate more mercury than many other popular seafood species. The FDA recommends that consumers eat canned white tuna over tuna steaks, as it is likely to have lower mercury levels (Food and Drug Administration, 2015).

Conclusion

The media is such a popular and powerful source of fisheries information for the public, with the potential to educate Americans to make choices that support sustainable fisheries policies. Thus, I will examine the media's fisheries agenda and consider how the media's coverage of fisheries might influence readers. The topics that are frequently covered by the media are likely to shape the public agenda about fisheries, and to prime readers to take specific issues and perspectives into consideration when deciding which seafood to buy or which policies to support.

There are a number of important topics that have been identified by scientific research that would be important for newspapers to convey to the public in providing Americans with some basic contextual and scientific information necessary for making decisions about the seafood they consume or the fisheries policies they support. Perhaps most importantly, Americans should be aware of the health and status of the world's fisheries, including whether or not the fish they are buying is from an overfished species. Additionally, they should be aware of the impact of catch methods and aquaculture techniques on marine life and the ocean environment. Furthermore, consumers should be aware of the extensive global trade of fish and how this impacts both the economy and

the environment. Since larger issues like climate change, ocean acidification, and pollution also impact fisheries, these problems should be connected with fisheries to help people understand the indirect impacts of their actions. Management and regulation needs to be improved in order to address many of these issues, so this should be a topic that is heavily addressed. Finally, there are a number of important human health considerations, both positive (such as seafood's ability to provide protein and contribute to a balanced diet) and negative (such as contamination from mercury or antibiotics). Overall, the media should ideally present fisheries as a complex issue with a number of important dimensions and considerations, so that the American public is not making decisions about these issues from a biased or incomplete perspective.

RESEARCH METHODS

The purpose of this study is to characterize the media's fisheries agenda by systematically analyzing fisheries content in newspapers. The topics being covered are likely to be more salient in readers' minds, which primes them to make decisions that take these particular focal issues into account. To that end, thematic coding of newspaper articles identified the topics being covered most frequently by the media. The study focuses on the following research questions:

> *What is the news media's fisheries agenda, and how might this impact readers' seafood choices and support for fisheries policies?*

I address the first part of the question by quantifying coverage of different fisheries topics identified by scientific reports – organized into environmental, economic, and social/political concerns – in order to identify the general topics receiving the most coverage. I also examine the major stories (e.g. the Gulf oil spill, the fight to approve GMO salmon) that received high amounts of coverage, with the goal of characterizing the types of stories that receive attention and how they are presented to the American public. I break my analysis into stories because the news media typically presents issues as stories, so I wanted my analysis to mirror the structure of news articles. The implications for sustainability are determined by evaluating the major problems, solutions, and frames being discussed by the news media, and considering how this might affect the public's definition of fisheries issues and their feelings of agency in solving them.

Research and Epistemological Approach

In order to answer my research question, I systematically collected and coded newspaper articles about fisheries and seafood, then categorized the articles into broad

themes representing different dimensions of fisheries issues. I also compared the major topics and concerns covered in the media with the major concerns highlighted in three scientific documents: 1) the Food and Agriculture Organization of the United Nations' 2014 report, "The State of the World's Fisheries", 2) National Oceanic and Atmospheric Administration's 2014 report, "Fisheries of the United States", and 3) Seafood Watch's 2011 report, "Turning the Tide: The State of Seafood". All three of these comprehensive reports synthesize the most current scientific data to discuss the state of fisheries, and thus suggest issues that might be important to have on the media agenda. I also looked at recommendations from Monterey Bay Aquarium's Seafood Watch program and the International Seafood Sustainability Foundation's 2016 report to identify specific concerns associated with individual species. Finally, I considered how the clarity, content, and conflicts in the media's dominant messages might influence a reader's understanding of fisheries topics and feelings of agency.

A few of major assumptions underlie this research. The first is that the media agenda influences the public agenda, so by analyzing the media's seafood agenda, we can begin to understand how the public will think about fisheries. The second is that most citizens learn about scientific information through intermediary channels, and because the media is often cited as the primary public source of marine and environmental information, it serves as a link between scientists and the public. Thus, the media is largely responsible for shaping how people think about these issues.

This research is based on constructivist ideas of reality because of its use of agenda setting as an analytical theory. This point of view asserts that sustainability problems are not objective conditions, but rather socially-constructed problems that

become recognized through communication, discourse, and interactions between the media and the public (Hansen, 2010; Scheufele, 1999). If realities are socially constructed and the media is an important part of this construction, then it is essential to study the processes through which the media recognizes and portrays environmental topics. The study is also influenced by post-positivist ideas, because the systematic coding of newspaper articles using a standardized coding system implies that there is a way to objectively measure reality (Denzin & Lincoln, 2005). This discrepancy in epistemological approaches to theory and methods of analysis is acceptable because although problems don't exist objectively, we can still accurately evaluate the occurrence of specific topics, solutions, and sources of information.

Newspaper Sampling

News articles were collected from 5 major U.S. newspapers: *The New York Times*, *The Los Angeles Times*, *The Washington Post*, *The Wall Street Journal*, and *USA Today*. These newspapers were selected based on two main criteria: a large audience and varied geographic distribution. These criteria are important because the purpose of this study is to gain a broad, general idea of the information that is reaching the largest number of Americans. All five are in the top ten U.S. newspapers in the Alliance for Audited Media's September 2014 circulation report. A summary of each newspaper is provided in Table 7. The purpose of sampling large newspapers (rather than small, local newspapers) is to gain a broad overview of how the media constructs seafood issues, with the goal of understanding what information Americans are exposed to. Additionally, mainstream media organizations (as opposed to more local media outlets) tend to express the concerns of dominant cultural groups rather than marginalized groups, so analyzing

national newspapers is ideal in attempting to understand the characteristics of mainstream culture regarding seafood issues and sustainable fisheries (Widener and Gunter, 2007).

Table 7
Newspaper Sample

Newspaper	Location	Circulation[1]	Reader demographics
The New York Times	New York City, NY	2,134,150	Young to middle-aged, roughly equal male/female, middle to high income, college-educated, moderate/liberal[2]
The Los Angeles Times	Los Angeles, CA	965,598	Young to middle-aged, roughly equal male/female, variety of educational backgrounds, middle to high income, white & Hispanic[3]
The Washington Post	Washington, D.C.	776,806	Middle-aged, roughly equal male/female, middle to high income[4]
The Wall Street Journal	New York City, NY	2,276,207	Middle-aged, male, middle to high income, college-educated, moderate/conservative[2]
USA Today	Tysons Corner, VA	4,139,380	Middle aged, roughly equal male/female, low to medium income, college-educated, moderate/conservative[2]

[1] Data from *http://www.poynter.org/news/mediawire/277337/usa-today-wsj-nyt-top-u-s-newspapers-by-circulation*
[2] *Data from http://www.ibtimes.com/audience-profiles-who-actually-reads-new-york-times-watches-fox-news-other-news-publications-1451828*
[3] *Data from http://extras.latimes.com/extras/ads/circ_05.html*
[4] *Data from http://www.megamediamarketing.com/demographics.html*

Data collection took place via the LexisNexis Academic database (for the New York Times, USA Today, and Washington Post), the ProQuest Los Angeles Times database, and the ProQuest Wall Street Journal database. Articles were selected that focused on seafood and fisheries in general, as well as on three different types of seafood in particular: salmon, tuna, and shrimp. The reason for focusing on individual types is because seafood sustainability guides are organized by species, and each faces different conservation issues. These types were chosen because they are the three most popular types of seafood in the United States, with Americans on average eating 4 pounds of

shrimp per capita, 2.3 pounds of salmon per capita, and 2.3 pounds of tuna per capita each year (National Marine Fisheries Service, 2013).

Table 8
Sample Sizes

	Shrimp	Salmon	Tuna	Seafood	Fisheries	Total
The New York Times[1]	9	21	15	20	47	112
The Los Angeles Times[,2]	8	24	12	22	25	91
The Washington Post[1]	11	11	15	10	36	83
The Wall Street Journal[3]	8	16	15	27	21	87
USA Today[1]	6	10	2	11	10	39
Total	42	82	59	90	139	412

[1] *Data from LexusNexus Academic Database*
[2] *Data from ProQuest Los Angeles Times Database*
[3] *Data from the ProQuest Wall Street Journal database*

The time period for data collection spanned five years, from June 1, 2010 to June 1, 2015. The aim of the project is to understand recent coverage of seafood and fisheries, which is why only articles from the past five years will be analyzed. Articles were selected by using the key terms “seafood”, “fisheries”, and specific seafood names (“shrimp”, “salmon”, and “tuna”) as the search keywords. Since the goal of the study is to gain a broad understanding of how these species are discussed, the fishes were kept general (e.g., “salmon”), rather than searching for specific species (e.g., “Sockeye Salmon”). Search results were sorted by relevance, and a purposive sampling procedure was employed to select relevant articles from the pool of search results. Of the first 150 articles (sorted by relevance) in the search results for each search term, the ones with the key terms either stated explicitly or referenced in the title were chosen as part of the dataset. If articles contained multiple keywords, they were grouped into whichever topic seemed more dominant, as determined by the researcher. A total of 412 articles were

selected for analysis (see Table 8). The articles were downloaded as Microsoft Word files and saved for analysis.

Article Coding and Analysis

Newspaper articles were coded using NVivo, a qualitative data analysis software. Data analysis primary followed a deductive coding scheme with a pre-established codebook (Tables 9, 10, 11), but due to the exploratory and descriptive nature of this project, codes also emerged inductively. Codes did not map perfectly on to the sustainability concerns described in the previous chapter (see Tables 1, 2, 3) because many of those concerns include a number of more specific dimensions. For example, "illegal fishing" includes discussions of both fisheries management and commercial species health. In order to respect the complex, multi-faceted nature of fisheries issues and maintain the ability to analyze the specific components of each sustainability topic, codes were kept narrower where preliminary coding suggested this was necessary. The structure and components of the codebook will be referenced throughout the next section.

The codebook development was influenced by a combination of methodological practices, theoretical ideas, and pilot test coding on newspaper articles. The types of codes and structure of the codebook are based on the guidelines in Bernard and Ryan's (2010) "Analyzing Qualitative Data". A number of structural codes were applied, with the intent of providing basic description information about the articles, including: newspaper name, publication date, author, location, and scope of interest. The remaining variables —sustainability impacts, suggested solutions, sources of information—are thematic codes, which rely more on interpretation of the text by the coder.

The "sources of information" category was established to track the sources of information cited by the reporters, because this is known to have an impact on a reader's receptiveness to the material. Typically, the authors of newspaper articles are not the authority on the topic; rather, the sources they choose to cite are the authority, and different sources of information will have different types or levels of credibility. The specific codes were developed both inductively, through a pre-coding phase, and deductively, using the work of other researchers who analyzed newspaper coverage of wild animals (Corbett, 1995; Jacobson et al., 2011; Muter at al., 2013).

Government, university academics, experts, environmental groups, and human health experts were categories derived from the academic literature, because these groups are frequently used in environmental content analyses (Jacobson et al., 2011; Muter et al., 2012) and they have proven linkages to reader trust (McCallum, Hammond, and Covello, 1991; McInnis et al. 2015). These categories were deliberately kept separate in order to facilitate direct comparisons with the results of other studies. The other sources of information included in this category – fishermen, aquaculture (industry), fishing companies, seafood retailer, energy and natural resource extraction, citizens, research groups, and the media – were inductively added after emerging as distinct categories during preliminary coding. Fishermen, aquaculture, fishing companies, and seafood retail were added because they are important sources unique to the topic of this project, and have distinct interests and roles within the fishing industry. The additional sources of information categories – energy and natural resource extraction, citizens, research groups, and media – emerged as common sources of information, but I wanted to keep them

separate from the sources that have already been studied as distinct categories in other research projects.

The "sustainability impacts" theme codes – environmental, economic, and social/political – each include a number of subcodes that refer to specific issues within each broad category. These subcodes were developed based on test readings of seafood newspaper articles and on prior knowledge of seafood sustainability concerns (see Table 2). Some issues were more commonly referenced in the articles used for test coding and merited their own categories (e.g. "pollution" and "changing conditions") while some were less frequently mentioned and thus coded into a broader category (e.g. "environment or ecosystem health").

The "suggested solutions" codes were developed purely from test coding, which identified a need to code phrases that suggested some kind of action be taken in solving the sustainability issues being discussed. These categories are divided into both voluntary and mandatory actions, and distinguish between solutions that have actually been implemented and those that are being suggested or considered. These solutions codes are distinct from the "management and regulation" code in the social/political impacts category because they mention the presence of an action or solution, whereas the "management and regulation" code was used for discussions of a management policy's efficacy or public reception.

All of the codes are outlined in more detail in the codebook (in Appendix 1), with each entry including: a brief description, inclusion criteria, exclusion criteria, typical examples, atypical examples, and examples of phrases that should not be included within that theme code. The criteria for these codes were initially developed based on theory and

academic literature. The codebook criteria were modified after reading through and test coding fifty articles (which were not included in the dataset), and then were modified a second time after feedback from two test coders, who each coded three articles.

Table 9
Sources of Information Codes

Code categories	Description
Fishermen	Catching wild fish
Seafood companies	Catching or processing wild fish
Aquaculture	Farming or creating fish
Fish retail	Direct point of sale to consumers (e.g. restaurants, grocery stores)
Government	Local, state, national, foreign, or international formal governing bodies
Expert	Somebody with expertise but no explicit affiliation (e.g. "scientists" or "researchers")
University academics	Researchers affiliated with a university
Research group	A group dedicated to studying a particular topic, not affiliated with other groups
Media	Researching and disseminating news to the public
Citizens	Residents
Environmental groups	Preservation of the environment
Human health	Healthcare, health research
Energy & natural resources	Utilizing natural resources

Table 10
Sustainability Solutions Codes

Code categories	Description
Mandatory: Potential	Solutions mandated by the government or another authoritative body that are suggested.
Mandatory: Actual	Solutions mandated by the government or another authoritative body that are in place or have occurred.
Elective: Potential	Voluntary solutions, not mandated by the government or otherwise
Elective: Actual	Voluntary solutions, not mandated by the government or otherwise

Table 11

Sustainability Factor Codes

Code categories	Description
Sustainability factors: Environmental	
Environment or ecosystem health	Impacts pertaining to the environment or ecosystem as a whole, and that doesn't fall into a more specific category
Pollution	Pollution from fish farming, oil spills, trash that is discarded into the ocean, agricultural waste, human waste
Changing conditions	Climate change, warming waters, ocean acidification, changing temperatures, prevalence of storms
Marine life health	Pertaining to the health of all life in the oceans, and that doesn't refer to a specific commercial species or bycatch
Commercial species health	Overfishing, population numbers, breeding, disease
Bycatch	Reference to marine creatures that are accidentally caught during the fishing process
Sustainability factors: Economic	
Costs and profits	Mention of costs for producers, such as costs to business owners, fishermen, governments; value or worth of a product; sales or earnings
Trade and markets	Supply and demand, competition, functionality of the system, trade between markets
Jobs & livelihoods	Mention of fishermen and other people whose jobs depend on fishing or farming, either directly or indirectly; references to fishermen and their ability to continue working in the industry
Prices	Mention of costs for consumers; specifically aimed at identifying the relationship between price and consumers
Labeling	Discussions of labeling that do not specifically reference sustainability, such as country of origin or GMO labeling
Ecolabels and seafood guides	Ecolabels and seafood guides that help consumers choose sustainable seafood
Sustainability factors: Social and political	
Management & regulation	Discussion of the laws, policies, decision-making processes, and collaborations in place, and their efficacy and reception
Human health	How fish consumption, fish farming, or fishing practices impact human health (excluding contaminants and seafood modification)
Contaminants	Concerns about toxins and chemicals affecting the safety of consuming seafood
Seafood modification	Hormones, antibiotics, GMOs, safety of eating genetically modified fish
Public perceptions	Discussion of how people view seafood, companies, or the fishing industry, and the impacts of these perceptions
Cultural & technological change	Mention of historical situations and how our society has changed; mention of new technologies and their impacts
Social justice	Impacts on humans such as slavery, unfair or unsafe working conditions, equality or human rights issues

The unit of analysis remained flexible, ranging from a sentence to a paragraph, to facilitate the coding of complete ideas rather than being limited to specific units of text. A multidimensional coding scheme allowed for quotations to be potentially classified by multiple codes. As analysis continued, additional codes were inductively added if strong patterns or themes emerged that were not previously accounted for in the coding scheme.

Article content was analyzed by evaluating the overall coverage of three categories of sustainability concerns – environmental, economic, and social/political – to understand the major topics being covered in each area. These topics were compared to the major fisheries concerns identified by scientific reports. Coded article content was then qualitatively analyzed to identify major frames that emerged in discussions of fisheries. Frames were formulated based on their definition of the issue and suggested solutions. The prevalence of different topics and the framing of fisheries issues were evaluated together to determine their potential to inform the public about fisheries sustainability and related problems and solutions.

RESULTS

In this section, I first summarize basic descriptive information about the entire dataset. From there, I move on to looking at the coverage of the three specific species of interest in my study – shrimp, salmon, and tuna – and analyze the primary stories and topics of interest to each, before proceeding to examine the characteristics of fisheries coverage as a whole. This part of the analysis is intended to describe the media's fisheries agenda by looking at the frequencies of different topics in the news coverage.

In addition to looking at basic statistical information about fisheries coverage, this project is interested in the framing of seafood issues, because this has the potential to influence the reader's receptiveness to the material. There are three major pairs of contested frames that appear in these articles, dealing with the topics of responsibility for decision-making, foreign seafood imports, and the value of fish (Table 12). The presence of these frames will be highlighted in discussions of individual stories, and the Discussion chapter will go into detail about their implications.

Overall Media Trends

The 412 articles in the dataset ranged from 87 to 2244 words and appeared in 11 newspaper sections, primarily in General News (29.1%), National or U.S. (18%), and Business (14.1%) sections. In order from highest to lowest frequencies, seafood articles also appeared in Science, Local, Opinion, World, Life/Style/Travel, Blog, Food, and Health sections. Aside from salmon, shrimp, and tuna, which were intentionally included because of their popularity in the United States, the articles covered a variety of commercial seafood species, including: abalone, bass, carp, catfish, cetaceans, clams,

cod, crabs, lionfish, lobster, mackerel, menhaden, mussels, oysters, rockfish, sardines, scallops, shad, sharks, sturgeon, and swordfish.

Table 12
Common Frames in Media Coverage of Seafood

	Frame	**Problem definition**	**Solution strategies**
Responsibility for decision-making	Consumers are responsible for fisheries sustainability	Seafood is produced in ways that harm people, fish populations, animals, or the environment.	Consumers should buy sustainably
	Government is responsible for fisheries sustainability	Seafood is produced in ways that harm people, fish populations, animals, or the environment.	Government or other high-level groups should mitigate impacts to fisheries
The value of fish	Fish are important for their utility to people.	Fish populations are being depleted.	Human impacts should be the primary consideration in how we preserve fisheries.
	Fish are important for their intrinsic or ecological value.	Fish populations are being depleted.	Environmental impacts should be the primary consideration in how we preserve fisheries.
International trade	Foreign seafood is unsafe or unethical.	Foreign seafood is low-quality and competes with domestic fishermen.	Consumers should purchase domestic seafood, government should restrict imports.
	Foreign seafood is necessary to meet demand.	Foreign seafood is cheap and necessary to meet growing demand in the U.S.	The U.S. should increase their own production or import more seafood.

Environmental, economic, and social/political codes accounted for roughly similar percentages of coded text. Text coded for environmental issues typically referenced the state of the fishery or the environment to provide context for more dominant discussions of economic or social concerns. Management and regulation was

discussed in nearly half of the articles, and was frequently linked with other topics, most prominently commercial species health and international seafood trade. “Trade and markets”, “costs and profits”, and “jobs and livelihoods” were highly prevalent codes in the articles, emphasizing the importance of seafood as an economic product.

The majority of articles discuss mandatory solutions (e.g. government regulations or international agreements) to deal with fisheries problems, including those that have already been implemented as well as suggested or future solutions. There is a smaller emphasis on elective solutions wherein individuals or communities might impact seafood sustainability (Table 14). Articles also focused predominately on national (those that are outside the jurisdiction of the state or involve multiple states or regions) and international level issues, rather than local (those taking place at the city or county level) or state issues (Table 15). This means that fisheries concerns are largely presented as large-scale government level issues.

The government was the source of information most frequently cited by reporters, with 68.9% of articles citing a government official, agency, or report (Table 16). These sources typically provided statistics to support the need for new fisheries policies. Environmental conservation groups were the second most frequent source, followed by university scholars and fishermen. Environmental groups and fishermen were more opinionated and often critical of federal government policies, but for different reasons. Environmentalists were interested in protecting animals or the environment, while fishermen were interested in their jobs and livelihoods. University academics were cited by all parties to support various positions, and did not tend towards supporting certain viewpoints over others.

Table 13
Sustainability Factors Code Frequencies – Entire Dataset

Code	# of articles using code	% of articles using code	# times coded	% times coded
Environmental factors	**311**	**75.5%**	**1676**	**37.4%**
Marine life health	90	21.8%	198	4.4%
Commercial species health	245	59.5%	872	19.4%
Bycatch	23	5.6%	64	1.4%
Environmental & ecosystem health	104	25.2%	183	4.1%
Pollution	69	16.7%	166	3.7%
Changing conditions	58	14.1%	193	4.3%
Economic factors	**293**	**71.1%**	**1452**	**32.4%**
Producers	19	4.6%	22	0.5%
Trade and markets	182	44.2%	567	12.7%
Costs & profits	126	30.6%	213	4.7%
Consumers and the public	0	0	0	0
Prices	95	23.1%	179	4%
Labeling	41	10%	157	3.5%
Jobs & Livelihoods	98	23.8%	196	4.4%
Ecolabels and seafood guides	27	6.6%	110	2.5%
Social and political factors	**318**	**77.2%**	**1359**	**30.2%**
Management & regulation	173	42%	573	12.8%
Social justice	11	2.7%	42	0.9%
Human health	45	10.9%	138	3.1%
Seafood modification	24	5.8%	82	1.8%
Contaminants	70	17%	203	4.5%
Culture	42	10.2%	54	1.2%
Public perceptions	78	19%	168	3.7%
Cultural & technological change	54	13.1%	98	2.2%
	412 articles		4487 references	

Table 14
Solutions Code Frequencies – Entire Dataset

Code	# of articles using source	% of articles using source	# times cited	% times cited
Mandatory: Potential	156	37.9%	286	26.1%
Mandatory: Actual	225	54.6%	482	43.9%
Elective: Potential	79	19.2%	125	11.4%
Elective: Actual	98	23.8%	204	18.6%
	412 articles		1,097 citations	

Table 15
Scope of Articles – Entire Dataset

	Local	**State**	**National**	**International**
Salmon	30	9	31	12
Tuna	2	1	29	27
Shrimp	5	2	23	12
Seafood	17	5	41	27
Fisheries	15	18	56	50
Total	68	35	178	125
Percent	16.5%	8.5%	43.2%	30.3%

Table 16
Sources of Information – Entire Dataset

Code	**# of articles using source**	**% of articles using source**	**# times cited**	**% times cited**
Government	284	68.9%	964	23.2%
Environmental conservation	146	35.4%	320	7.7%
University academics	116	28.2%	340	8.2%
Fishermen	102	24.8%	292	7.0%
Seafood companies	87	21.1%	255	6.1%
Research Group	84	20.4%	166	3.9%
Experts	77	18.7%	132	3.2%
Citizens	68	16.5%	136	3.3%
Seafood retail	55	13.3%	146	3.5%
Media	28	6.8%	44	1.1%
Other	25	6.1%	46	1.1%
Energy & natural resources	24	5.8%	46	1.1%
Aquaculture	20	4.9%	57	1.4%
Human health	13	3.2%	40	0.9%
	412 articles		4160 citations	

In the following sections, I will go into detail about how the media has covered specific fisheries by highlighting the dominant stories concerning shrimp, salmon, and tuna. Because these three species have very different sustainability issues associated with them, drawing comparisons between the three will showcase similarities and differences in how they are discussed. Then, I will examine the overall coverage of fisheries in the

media to determine how the topics align with the sustainability issues established in the literature review.

Shrimp

Interestingly, although shrimp is the most popular seafood item in America, it has less newspaper coverage than either tuna or salmon, with 48.8% less coverage than salmon and 28.8% less coverage than tuna. Shrimp articles focused heavily on trade, especially regarding its impact on the livelihoods of shrimp fishermen, both in the United States and abroad. The Gulf of Mexico was referenced in 86.5% of the articles, with most of the discussion focusing on the aftermath of the 2010 oil spill, while 31% of shrimp articles mentioned slave labor in Thailand's fish farms. This section focuses on these two stories that received the most media coverage. Both the Gulf of Mexico and Thailand have strong shrimp industries and illustrate a number of scientific concerns surrounding shrimp production. These stories tend to be framed to emphasize the economic value of fish, the threats of foreign seafood, and the importance of country-of-origin labeling in informing consumer decisions about seafood.

Table 17
Media Coverage of Scientific Concerns about Shrimp

Scientific concerns	Media coverage[1]	Salience[2]
Bycatch	2.4%	Low
Habitat destruction	9.5%	Low
Human rights violations	14.3%	Low
Stock declines	38.1%	Medium
Jobs and livelihoods	40.5%	Medium
Impacts of aquaculture	42.9%	Medium
Imports	64.3%	High

[1] Percentage of articles referencing topic.
[2]Natural breaks in the percent of articles determined the salience of each topic.

BP Oil Spill and the Gulf of Mexico

The 2010 Deepwater Horizon oil spill in the Gulf of Mexico was an environmental disaster, but newspaper articles tended to frame it as more of an economic and social issue than an environmental issue. This is exemplified by the fact that 63% of coded material addressed just a few topics: trade (19% of coded material); prices, costs, and profits (18%); culture and public perceptions of seafood safety (16%); and jobs and livelihoods (10%). Fishermen and the government were the two most highly-cited sources on this topic, with fishermen commonly cited to illustrate the effects of the spill on their livelihoods. Government sources describe the state of shrimp populations or the Gulf; emphasize the safety of consuming Gulf seafood; or justify actions they have taken, such as restricting fishing areas and activities.

Fishermen were frequently cited to talk about how the costs of fishing are too high and the profits too low, which makes it increasingly difficult for them to continue in their chosen profession. For example, one shrimper lamented how "each trip out in our boat to get shrimp requires about $9,000 worth of fuel and about $1,500 for ice, groceries, and a crew of three—that's a big investment before you make a penny." (LAT-shrimp03). The reporters often included personal details about the fishermen as well, creating a story that evoked sympathy for the fishermen, as in this example:

> Fisherman Mauricio Blanco, 39, spent $8,000 on improvements to his boat in the off-season. Now he's scrambling to find a way to support his wife and five children. He has cut back expenses, including holiday shopping, until it looks like the grounds may reopen. "It's going to be a miserable Christmas," Blanco says. (USA-seafood22)

Fishermen rarely blamed declining fisheries or environmental conditions (such as the BP oil spill) for their endangered livelihoods; instead, they tended to focus on competition

from cheap imports and negative public perceptions about the safety of Gulf seafood. This emphasis on fishermen's livelihoods presents fish as objects of economic value, rather than as animals with intrinsic value.

Many articles covering the oil spill cited statistics about the prevalence of shrimp imports in American markets, such as the popular National Marine Fisheries Institute statistic that 86-90% (depending on the year cited) of our shrimp is imported. This was often linked to decreasing profits for fishermen as they struggled to compete against cheaper imports. The general sentiment of the articles was that, "the U.S. shouldn't be importing shrimp when we can make our own" (NYT-shrimp01). Many fishermen and local government officials blamed the Gulf oil spill for the nation's increasing preference for imported shrimp, because the spill created negative public perceptions about the safety of domestic shrimp:

> The images of oil slicks at sea and goopy oil in stands of cane along the state's 7,700 miles of tidal coastline has presented the Louisiana fishing industry with a public relations nightmare. Some buyers assume the catch is polluted; others simply would rather not buy a product now with the name Louisiana or gulf attached to it, seafood wholesalers say (NYTshrimp-09).

This seems to place responsibility on the consumers to make different decisions about the shrimp they purchase. The articles often included quotes from fishermen about how nobody wants to buy their shrimp anymore, and quotes from government officials saying that their tests prove that Gulf shrimp is safe to eat. There was a heavy bias towards supporting domestic shrimping efforts, and articles often highlighted the claim that imported shrimp is dangerous or unethical due to "labor rights abuses, hazardous working conditions, damage to ecosystems and the use of hormones and antibiotics" (NYT-shrimp01). Overall, the Gulf oil spill was framed as an event that harms American

fishermen by causing public distrust of domestic shrimp and increased demand for foreign shrimp.

Thai Shrimp and Slave Labor

Most of the shrimp consumed in the United States is imported from abroad, and Thailand is the biggest foreign supplier. Articles about Thailand tended to focus on the use of slave labor on boats that supply fish meal to shrimp farms, in which:

> … human traffickers lure workers from poor Southeast Asian countries with promises of jobs in Thailand. Instead, the smugglers sell the laborers to ship captains, who force them to harvest fish to be ground into meal and sold as feed to shrimp farms whose products ultimately end up in consumers' kitchens (LAT-shrimp08).

They often named specific companies that purchase shrimp from Thailand, such as Wal-Mart, Costco, Sam's Club, and Red Lobster, and sometimes even recommended that consumers avoid purchasing shrimp from these specific retailors.

The issue was also sometimes mentioned in conversations about a recent study on the prevalence of inaccurate seafood labeling. Articles citing this study would point out how consumers might be affected by being unable to make accurate food choices:

> If…they're unwittingly dining on farmed shrimp from Thailand rather than wild-caught gulf shrimp, they might be supporting an operation that relies on forced labor to catch the fish that are fed to the shrimp (WP-shrimp02).

Quotes like this attempt to get consumers thinking about the impacts of mislabeled seafood by showing how seafood choices can support slavery, rather than focusing on environmental implications. The general tone of these stories is critical of foreign shrimp businesses, and suggests that people should avoid buying Thai shrimp.

Table 18
Presence of Frames in Shrimp Articles

Frame category	Presence in articles
The value of fish	• Shrimp are important for their value to humans (e.g. providing livelihoods)
Level of decision-making	• Consumers should buy domestic seafood to support U.S. fishermen.
International trade	• Foreign shrimp threatens domestic livelihoods • Foreign shrimp is unsafe

In 2013, a disease crippled Thailand's supply of shrimp and caused prices to soar, which had a negative impact on many American businesses. Large seafood companies that sell imported shrimp faced a supply shortage and were forced to raise prices, which many business and restaurant owners worried would hurt their companies. As a whole, these dynamics highlight a trade-off between the success of local shrimp fishermen versus business owners; that is, American shrimp fishermen are likely to benefit from foreign supply shortages and price increases, while American businesses suffer.

Summary

In sum, despite the fact that habitat destruction and bycatch are major issues in shrimp fishing and farming, they were scarcely mentioned in newspaper articles. Unlike articles about tuna or salmon, human health risks or benefits from consuming shrimp were also rarely mentioned. Instead, articles focused on the business of shrimp fishing in both the Gulf of Mexico and Thailand, and considered how foreign shrimp operations negatively impact American fishermen, American consumers, and Thai workers. The two stories work together to create a sense that American shrimp fisheries are in danger and that foreign shrimp is to blame. The stories also touched on the importance of accurate

labeling of fish products and encouraged readers to check for country of origin labels when purchasing shrimp.

Salmon

Articles about salmon focused heavily on the benefits and drawbacks of aquaculture and genetic modification, while also touching on issues of wild stock declines and habitat damage. Health benefits were mentioned less frequently, appearing in approximately 10% of salmon articles. Half of the salmon articles in the dataset mentioned wild salmon populations, and 30% of these described salmon populations as "declining" or "endangered". Approximately 43% of the articles linked salmon health with environmental health, typically employing university academics or scientists to cite various reasons for salmon declines, including "climate change, overfishing, and habitat perturbations" (NYT-sal26) and "dams that prevent the fish from spawning" (NYT-sal21). Citizens were frequently cited to emphasize that restoring wild habitats and salmon populations was ideal for local residents.

Here I will focus discussion on the four primary topics that were covered: the degradation of wild salmon and their habitats, the impacts of salmon aquaculture, the potential introduction of genetically modified salmon into American markets, and the human health benefits of consuming salmon. Taken together, these stories characterize salmon as being important for both its intrinsic value and its utility to humans, and emphasize the importance of individual decision-making about salmon purchases.

Table 19
Media Coverage of Scientific Concerns About Salmon

Scientific concerns	Media coverage[1]	Salience[2]
Health benefits	10%	Low
Habitat damage	22%	Medium
Wild stock declines	23%	Medium
GMO salmon	27%	Medium
Impacts of aquaculture	50%	High

[1] Percent of articles referencing topic.
[2]Natural breaks in the percent of articles determined the salience of each topic.

Bristol Bay Mine Proposal

A quarter of the articles about wild salmon focused on the proposed Bristol Bay mine in Alaska, which would damage salmon habitat and contaminate their waters. The Environmental Protection Agency (EPA) released a report about how the proposed mine would damage the environment and the salmon and subsequently issued restrictions on the mining of the area. The mining company, Pebble Limited Partnerships, argued that the EPA was overreaching and killing potential job opportunities. University academics typically provided data to support the EPA's actions, discussing the importance of ecosystem health to the salmon populations and estimating the economic benefits of protecting the salmon.

While some lawmakers praised the EPA for protecting valuable land and the livelihoods that depend on them, many politicians—especially those from Alaska—were critical of the EPA's attempt to discourage mining efforts:

> "The EPA is setting a precedent that strips Alaska and all Alaskans of the ability to make decisions on how to develop a healthy economy on their lands," Murkowski said in a written statement. "This is a blueprint that will be used across the country to stop economic development." (LAT-sal26)

Environmental groups and local residents tended to side more with the EPA. Environmental groups protested "industrializing a landscape that is today one of the most

pristine places on Earth" (LAT-sal26), arguing that their criticisms were not anti-mining, but rather, about “recognizing that some places are not appropriate for these sorts of industrial activities” (WP-sal7). Local citizens were likewise concerned about the mining operations ruining both the environment and their potential to make a living off the land and resources, including the salmon. Overall, both sides claimed that their position was economically advantageous, but the anti-mining voices (including environmental groups, local citizens, academics, and the EPA) framed the issue as a matter of protecting “pristine” natural landscape, while pro-mining voices (the mining company, local government) framed it as an issue of local autonomy and federal government overreach. The anti-mining voices typically received more attention, giving the stories an environmental slant towards emphasizing the intrinsic value of salmon and their ecosystems.

Salmon Aquaculture

Articles about farmed and genetically modified (GMO) salmon also highlighted a tension between the intrinsic and utilitarian value of the fish. Typically, wild salmon were described as being natural and pure, while farmed and GMO salmon were heavily criticized for their perceived artificiality and their impacts on wild salmon. Critics of salmon farming, which are primarily environmental groups and scientists, tended to focus on threats to wild salmon populations. Scientists often worry that farmed salmon may “contaminate the gene pool” (NYT-sal21), which is problematic because “many scientists believ[e] that hatchery fish are genetically much weaker—more susceptible to disease—and likely to impart those weaknesses to wild fish” (LAT-sal15). For these reasons, “hatched salmon could threaten the long-term survival of wild salmon unless precautions

are taken;" they are also harming the wild salmon populations by "competing for food and space" (NYT-sal1). Several scientists point out that wild salmon are the keepers of genetic diversity, and that this diversity allows salmon populations to adapt to changing conditions. Overall, the evidence presented in these articles suggests that scientists are interested in farmed salmon populations being kept completely separate from wild populations, and they frame their argument in terms of threats to wild salmon populations.

Supporters of fish farming, most prominently the aquaculture companies themselves, said that farmed salmon are a "healthy and relatively cheap food source that, as global demand for fish increases, can take some pressure off our wild fish stocks" (NYT-sal17). They also tried to highlight examples of safety precautions that fish farms have taken to avoid the ecological and biological damage described by opponents, arguing that "the entire salmon farming industry is becoming more sustainable and less environmentally damaging overall" (USA-sal1). The aquaculture industry was often supported to an extent by sustainable seafood groups, such as Monterey Bay Aquarium's Seafood Watch and the New England Aquarium's sustainable seafood program, both of whom have acknowledged the problems with the industry but said that they are "…very hopeful about the direction the industry is heading in. We hope to see the impacts of farmed salmon minimized to the extent possible" (USA-sal2).

Aquaculture companies and their supporters also argued that it will ultimately help wild salmon populations by reducing fishing pressures, but focused more on the benefits to humans over impacts on the environment and wildlife, framing the issue as a matter of human health and food security. They emphasized how fish farming has

impacted the fish markets in the United States by transforming salmon from “a luxury you only had on rare occasions to something that's an everyday protein” (USA-sal1).

Genetically Modified Salmon

Another dominant theme in the salmon articles was the potential approval of genetically modified (GMO) salmon for U.S. markets. This GMO Atlantic salmon “grows twice as fast as conventional salmon because a growth hormone gene derived from the chinook variety has been spliced into its DNA” (LAT-sal17). Approximately 27% of the salmon articles mentioned genetic modification, all of which specifically referenced the company AquaBounty and its attempt to get its genetically modified salmon approved by the Food and Drug Administration.

One common concern expressed in the articles was that GMO salmon could cause human health problems. The primary argument made by citizens, consumer advocacy groups, and elected politicians was that “there's not enough data to prove the salmon is safe to eat” (WP-sal2). There is not one mention of a specific health risk, always just the vague warning that there *could* be some kind of risk, and we just do not know about it yet. The underlying assumption seems to be that the fish should be assumed harmful until proven safe. Accordingly, these consumers want ecolabels to tell them whether a fish is genetically modified, so that they can choose to avoid it if they wish. AquaBounty strongly opposes GMO labels, because they believe that negative consumer perceptions of GMO food will hurt their sales. Approximately 85% of the articles about genetically modified salmon also mentioned ecolabeling.

Perhaps part of the reason for this mistrust of GMO fish is because the GMO salmon were often talked about as a technology rather than an animal. Several of the

articles referred to AquaBounty's GMO salmon as "Frankenfish", which suggests that the fish are unnatural monsters. One article revealed that the Food and Drug Administration (FDA) doesn't even regulate the fish like it does other food animals; instead, "under a policy announced in 2008, the F.D.A. is regulating genetically engineered animals as if they were veterinary drugs and using the rules for those drugs" (NYT-sal2).

The fact that genetically engineered creatures are not even seen as animals by the national government suggests a culturally embedded cognitive divide between the "scientific" and the "natural" by placing GMO fish firmly in the "technology" category, which stirs up any skepticism people might have towards science or technology. One employee of Greenpeace criticized the scientific process, saying: "I don't see the necessity of it. We don't need to build a new fish" (LAT-sal2). A member of the Alliance for Natural Health was also critical, saying that, "Science cannot prove that this new gene-spliced salmon is safe for human consumption over a long period of time. This recklessly and needlessly endangers human health" (WP-sal6). These quotes help to illustrate a general theme in the articles, which was that genetically engineering a new fish is seen as unnecessary and unnatural, and for that reason, the fish and the scientists who created it should be mistrusted.

Many articles on the topic pitted these GMO salmon against wild salmon and other animals, always with the suggestion that these engineered fish were endangering the natural, non-engineered wildlife. Many articles worried that "super-salmon could breed with wild salmon or outcompete wild fish for available food, endangering the survival of the species and possibly harming other aquatic life" (LAT-sal6). Sentiments like this, typically made by environmental conservation groups and human health

advocacy groups, were echoed through 70% of the articles about GMO salmon. These arguments are similar to those made against salmon aquaculture, with the same concerns about wild salmon populations being contaminated.

Overall, the anti-GMO salmon voices, which were dominant in this discussion, framed the issue as a matter of preserving what is "natural", by suggesting that GMO salmon are unnatural pieces of technology that threaten the environment, wild salmon, and potentially consumers. These voices suggested that genetic modification is a dangerous scientific endeavor wrought with uncertainty, a result of mad scientists playing around with nature. The discussion about labeling also framed the topic as a matter of consumer choice and access to information, by suggesting that consumers have a right to know what they are eating, and if GMO salmon aren't labeled, people could suffer negative health consequences.

This perspective was often countered in the articles with a statement by an AquaBounty or FDA official outlining the safety precautions taken by the company or listing the benefits of producing GMO salmon. Ron Stotish, chief executive of AquaBounty, frequently explained that growing genetically modified salmon can "reduce the over-fishing of wild salmon populations, bolster the world's food supply and use fewer resources" (WP-sal2). The salmon "consume up to 25% less food, and reach market weight in half the time" (LAT-sal3) compared to traditionally farmed salmon, which proponents argue constitutes a significantly more efficient use of resources. Supporters also attempted to dispel the criticism leveled at them by anti-GMO groups, saying that "the salmon would be grown only in inland tanks or other contained facilities,

not in ocean pens where they might escape into the wild. And the fish would all be female and sterile, making it impossible for them to mate" (NYT-sal2).

University academics and the FDA also frequently expressed the opinion that eating GMO salmon is not dangerous, arguing that "the salmon contains nothing that isn't in the human diet" (NYT-sal8) and attempting to sooth the fears of worried consumers by saying that they "would not feel alarmed about eating this kind of fish" (LAT-sal4). Many academics, however, also acknowledged the uncertainty around determining the safety of GMO salmon: "If you put the top scientific researchers in this area into a room, they would have to work very hard together to figure out the conclusion for ecological risk. This is very, very complex" (WP-sal11).

Overall, as with the discussion on aquaculture, the pro-GMO emphasis was on how GMO salmon can support a growing human population. These voices attempted to assuage their opponent's fears that the fish are unsafe for humans and the environment, and instead focused on how their salmon can benefit consumers: "With a global population pressing against food supplies and vast areas of the ocean swept clean of fish, tiny AquaBounty Technologies Inc. of Waltham, Mass., says it can help feed the world" (LAT-sal2). However, the negative, critical voices were often privileged in the articles over these positive voices, both through greater abundance of coverage and more strategic placement in the articles (e.g. being at the very beginning or the end of articles, which increases the salience of that point of view to readers).

Health Benefits of Salmon

All of the articles about the human health impacts of salmon consumption, which account for 10% of all salmon articles, presented eating salmon as a positive dietary

choice, due to the fish's high concentration of minerals and omega-3 fatty acids. This emphasizes their utilitarian importance in improving human health. Many articles cited recommendations by the U.S. government and health professionals that Americans "increase their seafood intake to at least 8 ounces a week, or about two servings" (USA-sal7). A number of these articles also specifically recommended wild salmon over farmed salmon:

> When fish are penned, they don't get normal exercise, so they don't build up as much muscle protein as normal and may have lower protein levels, and the healthy-fat content of oily farmed fish may not be as good as that of wild fish. (WP-sal9)

This means that despite the efforts of aquaculture to meet demand for salmon and relieve pressure on wild stocks, people are still demanding wild salmon over farmed salmon. Government departments (such as the FDA), physicians, and human health organizations (such as the American Heart Association) were the most commonly cited sources in discussing human health impacts, and their overwhelming recommendation was that people increase their consumption of salmon.

Summary

In many of the topics covered— including mining in Bristol Bay, aquaculture, and GMO salmon—wild salmon are idealized as being clean, natural, and pristine. On the other hand, farmed or GMO salmon are criticized for being artificial and dangerous, both to the environment and to human health. This highlights a contradiction in how we understand and appreciate salmon. On the one hand, they are presented as beautiful, wild creatures whose habitat (e.g. in Bristol Bay) shouldn't be destroyed. When farmed or GMO salmon threatens these wild salmon, they are heavily criticized.

Table 20
Frames Present in Salmon Articles

Frame Category	Presence in Articles
The value of fish	• Wild salmon are more valuable than farmed or GMO salmon • Salmon are valuable for their health benefits
Level of decision-making	• Consumers should choose wild over farmed or GMO salmon • The government needs to mandate labeling for consumers to have the ability to avoid farmed or GMO salmon
International trade	• Not addressed

At the same time, salmon is also valuable for its positive contributions to human health. Discussions about GMO salmon have a strong focus on ecolabeling and the consumer's right to know whether their purchases are "natural" or "artificial". Taken together, making decisions about salmon would require people to weigh the costs to the environment and other people against the potential health benefits of consuming salmon. This kind of uncertainty in the face of conflicting views might complicate and impede consumer decision-making.

Tuna

The most common topic in articles about tuna was the decline of wild tuna stocks, specifically bluefin tuna. This is linked to the issue of transboundary management and regulation, because tuna are highly migratory animals that require management at an international scale. Fishing for tuna is also known to have high incidences of bycatch, especially of dolphins and turtles. Although tuna is the third most popular seafood in the United States, it also has high levels of contaminants (such as mercury) because it is high on the food chain and accumulates toxins from its prey.

Table 21
Media Coverage of Scientific Concerns about Tuna

Scientific concerns	**Media coverage**[1]	**Salience**[2]
Bycatch	20.3%	Medium
Contaminants	22%	Medium
Management and regulation	27.1%	Medium
Wild stock declines	50.8%	High

[1] Percentage of articles referencing topic.
[2]Natural breaks in the percent of articles determined the salience of each topic.

Because wild stock declines and management issues are often discussed together, I will focus my discussion on the case of the bluefin tuna as well as on the issues of bycatch and contaminants. Tuna discussions focus heavily on the consumer's ability to choose fish that is low in mercury and was caught without bycatch. They don't tend to describe tuna as being intrinsically valuable, but instead emphasize how tuna relate to the health of humans and other sea creatures (such as dolphins and turtles). There are also criticisms of foreign management of tuna, specifically in Japan and Mexico.

Bluefin Tuna

Although most of the tuna consumed in the United States is canned albacore, the status of bluefin tuna was more frequently covered in the media, appearing in 44.1% of all articles about tuna. These articles highlighted the endangered status of bluefin and attributed this to high demand in Japan, which consumes 80% of all bluefin globally, in addition to intensive fishing technologies and illegal harvesting that well exceeds quotas. The value of the fish is frequently measured in terms of its culinary qualities, which portrays it as being valuable primarily for its benefit to humans. Bluefin is described as "luscious, fatty" (LAT-tuna10) and is "hailed as the finest cut of tuna sashimi" for its "oil, fatty belly" (LAT-tuna4).

Government sources, especially representatives from the National Oceanic and Atmospheric Administration (NOAA), were the most frequently cited, followed by research groups, university academics, and environmental conservation groups. NOAA officials often criticized the efforts of international organizations, specifically the International Commission for the Conservation of Atlantic Tunas, for not doing enough to monitor and enforce restrictions on bluefin tuna fishing. Environmental groups were even more critical, often arguing that "the responsible thing to do is to stop the fishing until effective management measures are in place that will ensure a reversal of the population decline" (NYT-tuna14) and emphasizing "it's really hard to have sustainable and bluefin…in the same sentence. It's always a bit of an oxymoron" (LAT-tuna04). The Pew Environmental Group and Pew Charitable Trust also had prominent voices in this conversation by using their own research projects to illustrate population declines of bluefin tuna and to make specific policy recommendations.

Overall, bluefin tuna were frequently discussed in the context of management. Everybody acknowledges that bluefin populations are threatened, but newspapers highlighted arguments among different groups about how to appropriately manage the fishery. Suggestions ranged from complete cessation of fishing efforts (usually proposed by environmental groups) to improved monitoring and enforcement of existing regulations to prevent illegal harvesting and control the technologies that are used (although specific solutions about how to do this are rarely presented). The issue is not presented as one that consumers can readily engage with, but instead as a higher-level management issue.

Bycatch

Bluefin tuna are also frequently caught as bycatch when fishermen are trying to catch other species of tuna. Bluefin, along with dolphins, sharks, and turtles, were frequently mentioned as victims of indiscriminate tuna fishing methods. Environmentalists and consumers were the groups who expressed the most concerned about this issue, and ecolabels were a commonly-discussed solution to this problem. However, even though dolphin-safe labels have existed for a number of years to alert people to tuna that has been caught in a manner that doesn't harm dolphins, many people questioned the legitimacy of these labels:

> …Even today, and even with dolphin-safe labels, the potential for bycatch persists. Many doubt whether dolphin-safe labels even guarantee that no dolphins were harmed in the process. And the American consumer, if not completely put off by the potential for that reality, is at the very least a little inhibited about buying tuna (WP-tuna1).

The newspaper articles consistently pointed out that although we might have thought we had the dolphin bycatch issue solved with the introduction of dolphin-safe ecolabels, and although dolphin bycatch has been significantly reduced, "even at the present level of about 1,000 dolphins per year, it remains among the largest documented cetacean bycatch in the world" (WP-tuna2). This discussion makes it clear that consumer choices are not likely to be impactful, because the problem is with the regulation of dolphin-safe labels.

In contrast to these concerns over the levels of bycatch, fishermen were often cited to express their frustration with the labels and bycatch regulation. When asked about bluefin being accidentally caught in nets, one fishermen said, "No one wants to interact with bluefin. They come onto your gear accidentally. No one is targeting them" (WP-tuna5). Nevertheless, these unintended consequences can have real environmental

implications. Ecolabels also cause trade disputes, particularly with Mexico, which claimed that "U.S. labels on cans and pouches of tuna were illegal because they effectively excluded Mexican yellowfin tuna from the U.S. market and caused a third of the nation's tuna fleet to shut down" (LAT-tuna5). The general sentiment from fishermen was that bycatch is often unavoidable, and that dolphin-safe labels are unfair to fishermen who might be punished for accidental infractions.

The main point of conflict in this issue was over whether tuna caught in a way that minimizes bycatch should be labelled as such, and whether these labels are reliable. Some consumers wanted the labels so that they can make choices that align with their ethical values, saying that "U.S. consumers rely on the labels to make smart choices and prohibiting them 'is among the few things likely to unite Americans across the political spectrum'" (LAT-tuna5). On the other hand, tuna producers see the labels as bad for business, and argue that bycatch is an inherent part of the job. Thus, advocates for ecolabels appeal to an American audience's values of independence and free choice, while fishermen attempt to attract reader empathy.

Contaminants

Nearly a quarter of tuna articles mentioned their potential for contamination, most often from methylmercury, a type of mercury that can affect memory, speech, hair loss, and heart health. Coal-burning power plants were identified as the primary source of mercury contamination in the oceans, and tuna accumulate a lot of it because they are high on the food chain. Citations from government officials and academics often served to warn the public, especially children and pregnant women, about the potential dangers of consuming too much tuna, often recommending safer species instead.

However, officials from organizations like the American Heart Association and the Federal Drug Administration have suggested that warnings about mercury are too severe, and that although tuna may contain contaminants, “the bottom line is that the benefits of eating fish far outweigh any downsides; it actually is a bigger health risk to not eat fish” (USA-tuna2). Thus, these articles cited scientists and government officials to support arguments that tuna both is and is not safe to eat, thereby leaving readers with an unclear picture to guide their seafood choices.

Summary

Overall, the main messages that readers would get from newspaper articles about tuna are that bluefin tuna are endangered and poorly managed; that dolphins and other animals are accidentally caught while fishing for tuna; and that tuna is full of contaminants, such as mercury. Unlike with salmon, the articles present no compelling health reason to eat tuna, instead focusing on the negative health and environmental impacts of catching and consuming tuna. Tuna are largely described as valuable for their positive culinary qualities, emphasizing their utility to people over their intrinsic or ecosystem value. As with shrimp, foreign interests are presented in a largely negative light, in this case for being uncooperative about tuna management. Finally, discussions about ecolabels deem them inadequately regulated, which suggests to readers that they cannot be certain that their decisions will impact bycatch in tuna fishing.

Table 22
Presence of Frames in Tuna Articles

Frame Category	Presence in Articles
The value of fish	• Valuable for their utility to humans (food) • Managing tuna fishery important for protecting other animals (e.g. dolphins, turtles) and fishermen
Level of decision-making	• Government is responsible for managing tuna fisheries • "Dolphin-safe" labels are poorly regulated, so consumers are unable to make informed decisions
International trade	• Other countries (e.g. Japan, Mexico) to blame for tuna declines and bycatch issues

Fisheries Generally

When compared to specific fisheries concerns listed in scientific reports, newspaper coverage of fisheries in general emphasized economic concerns over social, political, and environmental concerns. Climate change and ocean acidification, despite being major threats to global fisheries (FAO, 2014), were scarcely mentioned. Pollution of the oceans—which includes pollution from fish farming, oil spills, and trash that is discarded into the ocean—was a frequently cited topic, although nearly half (43.5%) of the articles referencing pollution were specifically talking about the Gulf oil spill.

Environmental Factors

Decreasing fish populations, pollution and coastal development, climate change and ocean acidification, and the environmental impacts of aquaculture were all issues of intermediate salience on the media agenda, while decreased marine biodiversity, bycatch and discards, invasive species, and habitat damage had relatively low salience. Articles that addressed decreasing fish populations either made general statements about how "the

vast majority of the world's fisheries are declining" (WP-fisheries03); or focused primarily on a few species, including: Bluefin tuna, king salmon, menhaden, and cod. Menhaden discussions were driven by a reduction in catch limits set by the Atlantic States Marine Fisheries Commission in the face of declining population numbers. The fish were described as being integral species to many ocean ecosystems in the Atlantic and Chesapeake Bay, and their dwindling numbers could have a cascading effect up food chains. Cod was mentioned in 16.3% of the articles, typically to describe declines in cod stocks and how New England fishermen have suffered because of it.

Table 23
Media Coverage of Scientific Fisheries Concerns

Scientific concerns	**Media coverage[1]**	**Salience[2]**
Environmental		
Invasive species	2.2%	Low
Decreased marine biodiversity	2.2%	Low
Bycatch and discards	5.6%	Low
Habitat damage	7.5%	Low
Climate change	12.6%	Medium
Impacts of aquaculture	12.9%	Medium
Pollution & coastal development	16.7%	Medium
Decreasing fish populations	18.4%	Medium
Economic		
Supply-demand gap	8%	Low
Employment in fisheries sector	23.8%	High
Trade	25%	High
Social and political		
Traceability in the food system	10%	Medium
Health benefits of seafood	10.9%	Medium
Contaminants in seafood	17%	Medium
Inadequate management	24%	High

[1] Percentage of articles referencing topic. [2]Natural breaks in the percent of articles determined the salience of each topic.

Economic Factors

Fisheries employment and trade were both highly salient issues on the media agenda. Increased international trade was often linked with increased competition between domestic fishermen and cheap imported fish products, as seen for the case of shrimp. Fishermen's livelihoods were also often tied to the Gulf oil spill, which damaged fish habitat and thus decreased supply. The oil spill also ruined public perceptions of the safety of Gulf seafood and thus decreased demand for local fish.

Two of the most popular stories on the fisheries agenda were primarily focused on economic concerns: catfish farming and the health of New England fisheries. The catfish articles talked about how catfish imports (especially from Vietnam) are threatening American catfish farms. Catfish farmers described how feed and labor costs were more expensive in the United States than in Asian countries, and pushed for stricter import regulations and country-of-origin labelling based on the claim that foreign catfish was unsafe due to less stringent regulations. While some criticized this as blatant protectionism with the goal of stifling competition, others insisted that foreign catfish is raised in dirty water and loaded with antibiotics. Aquaculture interests often attempt to appeal to consumers, suggesting that "if you order a plate of catfish, you want to know that is safe for your family to eat" (USA-fisheries06). Overall, the news articles presented catfish farming as an industry that feels threatened by foreign suppliers.

Many articles also focused on declining catches of various species (most commonly cod) in New England waters, and how this was harming local fishermen, businesses, and culture. Stated causes of this decline included environmental degradation, overfishing, and strict government regulations on fish catches. For example, one article

describes the general sentiment of many New England fishermen in response to new fishing restrictions based on climate change projections:

> They blame the regulators, calling the moratorium cruel and needless, because they say their latest cod catches are actually better than in recent years. More than a few talk of a conspiracy between scientists and environmentalists to manufacture a fishing crisis that will justify their jobs (NYT-fisheries55).

Often, these articles point out that other businesses that are linked to fishing, such as marine supply companies and restaurants, will start to see declines in their business as fishermen catch less.

Social and Political Factors

Management and regulation was the most salient sociopolitical issue; while issues centered on seafood, such as traceability in the food system, seafood contaminants, and the health benefits of seafood all had a medium level of salience on the agenda. Issues of management and regulation were typically attached to discussions about many other topics, such as wild population declines, international trade, and fishermen's livelihoods. Most seafood and fisheries problems were discussed as problems that should be solved by the government, typically at the national or international level, rather than as problems that the public could directly engage with or influence.

One of the top stories was a report released by Oceana in 2012, which used DNA testing to determine whether seafood in grocery stores, seafood markets, and restaurants were correctly labeled. Overall, they found that 39% of the samples were labeled with the incorrect species. This finding was widely discussed in the media, with the primary concerns being impacts on consumers, including consumer fraud (being unfairly charged for a more expensive fish) and a consumer's impaired ability to choose fish based on

health, ethical, or environmental concerns. Specific ecolabels and sustainable seafood guides were infrequently mentioned, appearing in only 6.6% of all articles in the dataset.

Summary

Coverage of economic and management concerns were more prevalent than coverage of environmental concerns in the articles on seafood in general. Although environmental concerns were the most frequent per my coding categories, this is likely only the case because the state of the environment set the stage for the human issues, and many of these issues were specifically linked to the health of commercial species stocks. Thus, when looking at the prevalence of broader topics rather than code counts, economic and social issues are more common than environmental issues. Some topics were only discussed in relation to specific species – such as bycatch in tuna fishing, the impacts of aquaculture in salmon farming, and pollution in the Gulf of Mexico due to an oil spill – but were not frequent topics on the overall fisheries agenda.

Like previous studies of newspaper coverage of environmental issues, fisheries articles cited government sources the most, and these sources typically provided statistics to support the need for new policies. Environmental groups, academics and fishermen were also highly cited in newspaper articles. University academics played a similar role as government, typically providing information to support a particular point of view. Environmental groups and fishermen were more opinionated and often critical of federal government policies, but for different reasons. Environmentalists were interested in protecting animals or the environment, while fishermen were interested in their jobs and livelihoods.

Frames within the different stories tended to emphasize the utilitarian value of fish, the negative aspects of foreign trade and cooperation, and the impotency of individuals in making contributions to fisheries sustainability. In the discussion section that follows, I will examine these frames more closely to understand how the various frames within each story interact and how they might influence readers.

DISCUSSION AND CONCLUSION

The media is an inescapable force in American culture, with the power to set public agendas for discussion of environmental issues. Media is especially potent in shaping discussions around unobtrusive issues that people do not typically encounter in their daily lives. Because most people cannot experience the effects of declining fisheries firsthand, their reliance on the media for information about fisheries will be strong. Agenda setting theory suggests that the topics covered by the media will be the topics of public discussion, and priming theory suggests that people will be more likely to consider topics raised by the media when making decisions. Therefore, the intent of this research was to characterize the media's fisheries agenda for the purpose of understanding what topics are receiving the most coverage, because those are the topics that are likely to appear on the public agenda. The project also examined the presence of common frames among fisheries articles. The previous section summarized the relative frequencies of different topics, and this section delves into discussions of how the media coverage of fisheries might potentially impact readers, both through its framing and selective coverage of issues.

Alignment with Media Trends

People largely rely on the media to learn about fisheries and seafood, and this research builds on these previous findings by describing the content of media communications about fish. Newspaper discussions about seafood largely focused on economic and social dimensions of seafood, which aligns with research results showing that people tend to make seafood decisions based more on price, health, and social or cultural concerns than on environmental concerns (Oken et al., 2012). The low coverage

of topics such as bycatch, climate change, and marine habitats is also interesting considering survey findings showing that the public has low levels of knowledge on these topics (Steel et al., 2005a). This low level of coverage of environmental topics is important because "increasing public awareness and knowledge of highly technical and complex issues such as ocean and coastal ecology will lead to enhanced public support for the efforts needed to restore the biological health of the oceans (Pew Oceans Commission, 2003). By failing to cover environmental issues more prominently, the media is perhaps not doing enough to foster greater public understanding of the complexity of marine issues.

Newspaper coverage of fisheries followed many of the trends that we would expect based on previous research. It often emphasized the negative aspects of issues, with reporters primarily presenting critiques of topics such as aquaculture, ecolabeling, international trade, and fisheries management. It was also often event-driven, with major events like the Gulf oil spill, the Bristol Bay mining proposal, and the introduction of GMO salmon igniting conversations about broader topics such as fishermen's livelihoods, environmental degradation, and the impending approval of GMO salmon. However, this trend was not universal, as many of the topics – such as human health benefits or concerns, aquaculture, and bycatch in bluefin tuna fisheries – were discussions that seemed to be ongoing over a longer time period.

Framing of Seafood Stories

Most stories contained multiple frames, and there were trends among different species. Shrimp stories tended to use frames from all three categories; salmon stories were very concerned with the value of fish; and tuna stories were more interested in

discussions of international trade. Overall, the fisheries agenda is likely to make readers think that: they lack the information or agency to affect fisheries, foreign seafood is unsafe or unethical, wild fish are better than farmed or GMO fish, fish are important for their utility to people, and economic or social considerations are more important than environmental considerations.

Shrimp

The two shrimp stories – the Gulf oil spill and the Thai shrimp industries – each contain frames from all three categories, but the emphasis is on the concept of individual decision-making. Both stories emphasized that consumers *should* make careful decisions about their seafood, and this frame was supported by the dominant presence of two other frames: that foreign seafood is unsafe or unethical, and that fish are important for their utility to people (due to their importance to fishermen). Readers were asked to care about their seafood choices based on their empathy for the plight of fishermen, and fishermen were portrayed as being victims of an uninformed public and competition from cheap imports. This perspective was almost never balanced with a statement supporting foreign fisheries, so if readers were to base their seafood purchasing and policy decisions on their desire to support American workers, newspaper coverage of these topics would almost certainly push them towards buying domestic fish products. However, Americans continue to purchase imported seafood, suggesting that these appeals to American pride, success, empathy for other people, and fears of foreign influence are not sufficient to keep people from purchasing cheap foreign imports. This is consistent with research showing that price is the most important factor influencing how people choose to buy seafood (Horgen & Brownell, 2002; Verbeke & Vackier, 2005).

Salmon

Discussions about salmon focused primarily on the value of fish, and these discussions were further informed by frames of individual agency in seafood purchases. In stories about Bristol Bay, salmon aquaculture, and GMO salmon, the main tension was between the natural and the unnatural. In Bristol Bay, the arguments were explicitly about whether the bay should be protected for salmon or developed for people, with salmon clearly having more support. Articles about farmed and GMO salmon were more subtle about the utility versus intrinsic value discussion, but generally emphasized the intrinsic value of wild salmon over the utilitarian value of farmed or GMO salmon. These cultivated salmon were often described as "Frankenfish" that threatened to taint the genetics of wild stocks and destroy their environment. This clearly emphasizes the idea that wild fish are "natural" with intrinsic value and an important role in the ecosystem, while farmed or GMO fish are dangerous and unnatural. Because farmed and GMO salmon are intentionally produced to meet human demand, their negative framing in the media seems to eschew the idea of salmon as being important for their utility to humans. This could potentially weaken public support for policies that favor aquaculture as a strategy for meeting growing food demands.

This perspective is contradicted somewhat by the presence of articles about human health benefits. In these articles, the only frame generally present is that salmon are valuable for their utility to humans in promoting good health. Because health is a dominant motivation in determining which seafood people choose to buy (Oken et al., 2012; Lando & Labiner-Wolfe, 2007), the media's coverage of health concerns might outweigh other ethical and environmental concerns. Additionally, discussions about

GMO and farmed salmon often mention the need for ecolabels to inform consumers about the origins of their fish, so that they can avoid buying those products for fear of negative health benefits. Taken together, it might be concluded that the ultimate value of salmon is in its utility to people, but we are uncomfortable with salmon that appears to be created solely for human consumption. Instead, we prefer to think that we are consuming pure, natural salmon that thrive in pristine ecosystems.

Tuna

Tuna conservation is primarily presented as a government-level issue, and foreign governments and international organizations are often blamed for the lack of success in tuna management efforts. This again portrays foreign interests in a negative light, though in a slightly different way than foreign interests in shrimp fisheries. Here, foreign governments and organizations are described as being uncooperative and having different goals than the United States, rather than directly threatening American livelihoods. This negative portrayal of international groups is still likely to make Americans wary of foreign tuna.

As with salmon, there is a conflict of agency regarding the consumer's ability to make sustainable choices. Although ecolabels are discussed as a way to avoid fish caught with bycatch, a strong theme in the articles is that regulations on these labels are not sufficient. Thus, the consumer cannot be certain of making sustainable choices unless the regulatory agencies are appropriately monitoring the labels. The coverage of bycatch also suggests that the protection of other marine animals (e.g. dolphins, turtles) provides a compelling reason to monitor tuna fishing. This frames their value as being important for maintaining ecosystems.

Fisheries and Seafood Overall

All of these conflicting frames have the potential to influence a reader's impressions of fisheries sustainability. Taking into account all of the articles from the dataset, readers are likely to believe that fisheries sustainability is a large-scale management issue that they cannot impact individually; that foreign seafood is unsafe or unethical; and that fish is important primarily for health and economic reasons. They are less likely to consider the intrinsic or ecological value of fish.

The frames regarding agency in impacting seafood sustainability present two possibilities: that consumers *should* make informed seafood choices, and that they *cannot* make informed seafood choices. Both of these frames share the same problem – which is that fish production can be harmful to people, fish populations, animals, or the environment – but one frame advocates for personal choices to alleviate these problems, while the other suggests that there is a systemic problem that impedes the consumer's ability to make informed choices about what they buy. We see these frames conflicting in discussions about GMO salmon labels, dolphin-safe tuna labels, and country of origin labels – consumers are told that labels are necessary, but the current conditions suggest that the labels are not properly regulated, and therefore of little use to consumers aiming to make informed choices. The abundance of articles about the Oceana study that highlights the frequent mislabeling of seafood is likely to further deflate a reader's sense of agency. When read together, this might confuse and discourage readers from attempting to influence seafood sustainability through their choices. Additionally, the prevalence of discussion about management and regulation and top-down government

solutions is likely to present the issue as a topic that is beyond the influence of individuals.

The frames regarding the value of fish tend towards emphasizing economic and health utility to people, rather than intrinsic or ecological value. This means that instead of seeing fish as vital components of ecosystems, or as sympathetic animals that deserve our care and attention, readers are likely to understand them as resources that further human interests. The relative lack of environmental topics on the overall media agenda (especially compared to economic topics) further suggests that people will be primed to consider economic factors over environmental factors. Previous research has indeed shown it to be true that people consider price more than environmental concerns when making decisions about seafood (Horgen & Brownell, 2002; Verbeke & Vacker, 2005), so if the goal is to help consumers understand the environmental implications behind their choices, the media should prime readers to consider environmental impacts by covering it more heavily in stories about fisheries.

Finally, discussions about international trade largely frame foreign seafood in a negative way. This is consistent with the media's tendency to present the negative aspects of stories (Amberg & Hall, 2008; Compas et al., 2007), but unfortunately it provides readers with a narrow and biased view of foreign trade. Trade might become an increasingly necessary solution as fish supplies dwindle, so weakening support for it could be detrimental to future efforts to feed our human population.

Recommendations

To improve communication about marine issues and better encourage Americans to support sustainable seafood and fisheries policies, the media should makes efforts to reflect the following concerns:

1. *Increase coverage of environmental topics*. In order for Americans to support policies that adequately address all of the environmental, social, and economic concerns with fisheries sustainability, they need to better understand the complexity of the issue. This can be done by incorporating discussions of underreported environmental concerns – such as biodiversity, bycatch, and habitat degradation – into fisheries articles. Articles might also emphasize the roles that fish play in larger ocean ecosystems. Additionally, climate change and ocean acidification should be more prominently featured, because they are huge issues but their weakness on the media's fisheries agenda might prevent Americans from understanding the full ramifications of climate change. Currently, the stronger emphasis on human health and economics means that readers will likely be primed to consider these issues more than environmental issues when making decisions about fisheries policies and seafood consumption.
2. *Balance discussions of trade-offs.* Many of the major issues discussed in the media are slanted in ways that might discourage Americans from supporting potentially beneficial solutions to the fisheries crisis. For example, articles about aquaculture, genetic modification, and foreign trade often emphasize the negative qualities of these endeavors, without equally addressing the reasons why these might be necessary. Likewise, articles that present the government as opponents of fishermen risk

skewing the conversation towards supporting fishermen, even in the face of necessary management changes. Thus, better incorporating the benefits and drawbacks of situations and solutions would provide readers with a more balanced understanding of fisheries issues, rather than priming them to think about these topics from a one-dimensional perspective. This is important because as global fisheries supplies dwindle and demand grows, we will need a public that is more receptive to solutions such as aquaculture, trade, and tightened regulations, and presenting these solutions in a balanced way is vital for generating support.

3. *Present specific tools and actions for individuals*. Fisheries are often talked about at a national or international scale, where government rules and regulations are presented as the solution to fisheries problems. Labeling is frequently discussed as a way for consumers to purchase seafood in accordance with their values and desires, but the validity of these labels is often question, which would probably leave consumers confused. People prefer being presented with specific solutions targeted at specific fish (Oken et al., 2012), so naming specific ecolabels and seafood guides for consumers to use, or presenting other ways for individuals to be involved (such as support of public policies or other forms of civic action) might increase public engagement with fisheries issues and encourage more bottom-up actions.

Limitations of the Study

Discussions about the impacts that media coverage of fisheries issues might have on the general public will necessarily be limited to the demographic that reads newspapers. In general, people who read newspapers tend to have a high income and a high level of education. They also tend to be older, with 52 percent of people over the age

of 65 reading the newspaper daily, compared to only 20 percent of people between the ages of 25-34. Whites are the ethnic group that are most likely to read newspapers, with 33 percent of white respondents in a random survey saying they read a newspaper yesterday, followed by African Americans (28%), Asians (25%), other ethnicities (24%), and Hispanics (20%) (Barthel 2014). These discrepancies mean that this research will potentially be more relevant for thinking about agenda setting among the relatively rich, well educated, white people, as well as elderly.

This research is also limited to a specific period of time, between 2010 and 2015. Therefore, many of the topics discussed in this paper may not be on the media agenda anymore. However, because the goal of this research was to understand general characteristics of the media's coverage of fisheries in recent years – such as the types of stories that get covered, how they are framed, and who is involved in discussing them – the temporal limitation does not impact the findings of this study.

Finally, this research is primarily descriptive, and does not identify actual linkages between media coverage and public awareness. This link is assumed based on previous research that shows connections between media and public agendas, and this idea is part of the rationale behind this study, but it is not a part of this study's research design or goals.

Future Research

Future research should examine linkages between media and public agendas by using surveys. This would involve tracking the evolution of an issue in the media over time and testing how the public ranks the importance of the issue as the media coverage changes. For example, tracking the media coverage of GMO salmon and simultaneously

tracking public awareness of the issue over time would lend insights into whether media coverage influenced public awareness and knowledge of the topic.

Another interesting avenue of research would be to test the effects of priming on people's decision-making processes about seafood and fisheries issues. This type of research would work well in a laboratory setting, where participants could be primed with stories about different topics, and then be asked to make policy decisions and explain the rationale behind their answers. For example, two groups of participants might be primed with articles on either the benefits or drawbacks of salmon aquaculture, and then be asked to express support for different aquaculture policies. Significant differences between the responses of the two groups might indicate that priming influences decision-making processes.

Finally, it would be valuable to examine local (rather than national) newspapers to determine if there is a difference in how these topics are covered. Local newspapers might focus more heavily on issues that are salient to the local community. For example, local newspapers in the Gulf of Mexico area might have an even stronger focus on Gulf seafood and fishermen. There might also be coverage of topics that are not present in national-level newspapers. Studying foreign and international newspapers would be another interesting avenue of research, because many fisheries issues are global in nature. Additionally, other countries might have very different perspectives on certain topics. For example, because Japan consumes most of the world's bluefin tuna and because it is often resistant to international efforts to conserve the tuna, Japanese newspapers might focus much less on the bluefin's declining populations and instead discuss the fairness and legitimacy of trade restrictions and catch limits.

Conclusion

Because the media plays a large role in shaping public understanding of marine issues, marine conservationists and communicators should attempt to influence the media agenda to reflect a diversity of concerns. Frequent coverage of a particular issue or angle will prime readers to take these perspectives into account when making decisions, so careful consideration of what information is important and relevant to seafood sustainability decisions should inform how this information is disseminated to the media and the public. Some people will form their opinions about fisheries issues primarily from through their engagement with newspapers, television, and other forms of media, which means these institutions have a responsibility to ensure that they are presenting fisheries topics in a complete, holistic way that balances environmental, economic, and social perspectives. A media agenda that promotes complex thinking and sustainability has the potential to positively influence how Americans purchase seafood and support fisheries policies.

REFERENCES

Ader, C. R. (1995). A longitudinal study of agenda setting for the issue of environmental pollution. *Journalism & Mass Communication Quarterly*, 72(2), 300-311.

Almeida, C., Altintzoglou, T., Cabral, H., & Vaz, S. (2015). Does seafood knowledge relate to more sustainable consumption?. *British Food Journal*, 117(2).

Althaus, S. L., & Tewksbury, D. (2002). Agenda setting and the "new" news patterns of issue importance among readers of the paper and online versions of the New York Times. *Communication Research*, 29(2), 180-207.

Amberg, S. M., & Hall, T. E. (2008). Communicating risks and benefits of aquaculture: a content analysis of US newsprint representations of farmed salmon. *Journal of the World Aquaculture Society*, 39(2), 143-157.

American Press Institute (2014). "The Personal News Cycle: How Americans choose to get their news." Retrieved from: http://www.americanpressinstitute.org/publications/reports/survey-research/personal-news-cycle/.

Barthel, Michael (2014). State of the News Media 2014 - Newspapers: Fact Sheet. *Pew Research Center.* Retrieved from: http://www.journalism.org/2015/04/29/newspapers-fact-sheet/.

Beierle T, Cayford J. Democracy in practice: public participation in environmental decisions.Washington, DC: Resources for the Future; 2002 102pp.

Bernard, H. R., & Ryan, G. W. (2009). *Analyzing qualitative data: Systematic approaches*. SAGE publications.

Bodony, T. (2014). Framing of Fisheries in Collapse: A Content Analysis of Two Newspapers (Doctoral dissertation, University of Missouri--Columbia).

Boykoff, M. T., & Rajan, S. R. (2007). Signals and noise. EMBO reports, 8(3), 207-211.

Brosius, H. B., & Kepplinger, H. M. (1990). The agenda-setting function of television news static and dynamic views. *Communication Research*, 17(2), 183-211.

Brown, J. D., Bybee, C. R., Wearden, S. T., & Straughan, D. M. (1987). Invisible power: Newspaper news sources and the limits of diversity. *Journalism & Mass Communication Quarterly*, 64(1), 45-54.

Cicin-Sain, B., & Knecht, R. (2000). *The future of US ocean policy: choices for the new century*. Island Press.

Corbett, J. B. (1995). When wildlife make the news: an analysis of rural and urban north-central US newspapers. *Public Understanding of Science*, 4(4), 397-410.

Clover, C. (2006). *The end of the line: how overfishing is changing the world and what we eat*. Berkeley and Los Angeles, CA. University of California Press.

Cohen, B.C. (1963). *The Press and Foreign Policy*. Princeton, NJ: Princeton University Press.

Consumer Reports (2011). *Mercury in canned tuna still a concern: New tests reinforce a need for some people to limit consumption*. Retrieved from: http://www.consumerreports.org/cro/magazine-archive/2011/january/food/mercury-in-tuna/overview/index.htm.

Compas, E., Clarke, B., Cutler, C., & Daish, K. (2007). Murky waters: media reporting of marine protected areas in South Australia. *Marine Policy*, *31*(6), 691-697.

Culbertson, H. M. (1975). Veiled news sources—who and what are they. ANPA News Research Bulletin, 3.

Eagly AH, Kulesa P. Attitudes, attitude structure and resistance to change implications for persuasion on environmental issues. In: Bazerman MH, et al., editors. Environmental ethics and behavior: the psychology of environmental valuation and degradation. San Fransico, CA: The New Lexington Press; 1997. p. 122–53.

Entman, R. M. (1993). Framing: Towards clarification of a fractured paradigm. *McQuail's reader in mass communication theory*, 390-397.

FAO (Food and Agriculture Organization of the United Nations) (2014). *The State of World Fisheries and Aquaculture: Opportunities and Challenges*.

Feinberg, M., & Willer, R. (2013). The moral roots of environmental attitudes. *Psychological Science*, 24(1), 56-62.

Gifford, R., & Comeau, L. A. (2011). Message framing influences perceived climate change competence, engagement, and behavioral intentions. *Global Environmental Change*, *21*(4), 1301-1307.

Denzin, N. K., & Lincoln, Y. S. (1994). *Handbook of qualitative research*. Sage Publications, Inc.

Hackett, R. A. (1985). A Hierarchy of Access: Aspects of Source Bias in Canadian TV News. *Journalism Quarterly*, 62(2), 256.

Hansen, A. (2010). *Environment, media and communication*. New York: Routledge.

Hargreaves, I., Lewis, J., & Speers, T. (2003). Towards a better map: Science, the public and the media. Swindon, UK: Economic and Social Research Council.

Hicks, D., Pivarnik, L., & McDermott, R. (2008). Consumer perceptions about seafood–an Internet survey. *Journal of Foodservice*, *19*(4), 213-226.

Horgen, K. B., & Brownell, K. D. (2002). Comparison of price change and health message interventions in promoting healthy food choices. *Health Psychology*, 21(5), 505.

Jacobson, S. K., Langin, C., Carlton, J. S., & Kaid, L. L. (2012). Content analysis of newspaper coverage of the Florida panther. *Conservation Biology*, *26*(1), 171-179.

Kalaitzandonakes, N., Marks, L. A., & Vickner, S. S. (2004). Media coverage of biotech foods and influence on consumer choice. *American Journal of Agricultural Economics*, *86*(5), 1238-1246.

Kareiva, P. (2014). New conservation: setting the record straight and finding common ground. *Conservation Biology*, *28*(3), 634-636.

Lando, A. M., & Labiner-Wolfe, J. (2007). Helping consumers make more healthful food choices: consumer views on modifying food labels and providing point-of-purchase nutrition information at quick-service restaurants. *Journal of Nutrition Education and Behavior*, 39(3), 157-163.

Layzer, J. A. (2012). *The environmental case: Translating values into policy*. CQ Press.

Lewis, J., Williams, A., & Franklin, B. (2008). A compromised fourth estate? UK news journalism, public relations and news sources. *Journalism Studies*, 9(1), 1-20.

Lockie, S. (2006). Capturing the sustainability agenda: Organic foods and media discourses on food scares, environment, genetic engineering, and health. *Agriculture and Human Values*, 23(3), 313-323.

MacInnis, B., Krosnick, J. A., Abeles, A., Caldwell, M. R., Prahler, E., & Dunne, D. D. (2015). The American public's preference for preparation for the possible effects of global warming: impact of communication strategies. *Climatic Change, 128*(1-2), 17-33.

Miller, J. M., & Krosnick, J. A. (2000). News media impact on the ingredients of presidential evaluations: Politically knowledgeable citizens are guided by a trusted source. *American Journal of Political Science*, 301-315.

McAvoy G. *Controlling technocracy: citizen rationality and the nimby syndrome*. Washington, DC: Georgetown Press; 1999 168pp.

McCallum, D. B., Hammond, S. L., & Covello, V. T. (1991). Communicating about environmental risks: how the public uses and perceives information sources. *Health Education & Behavior, 18*(3), 349-361.

McCombs, M. (2014). *Setting the agenda: The mass media and public opinion*. UK: John Wiley & Sons.

McCombs, M. E., & Shaw, D. L. (1972). The agenda-setting function of mass media. *Public Opinion Quarterly*, 36(2), 176-187.

Monterey Bay Aquarium (2011). *The State of Seafood*. Monterey, CA: Monterey Bay Aquarium.

Muter, B. A., Gore, M. L., Gledhill, K. S., Lamont, C., & Huveneers, C. (2013). Australian and US news media portrayal of sharks and their conservation. *Conservation Biology*, 27(1), 187-196.

Nelkin, D. (1987). *Selling science. How the press covers science and technolog*y. New York: Freeman, 1987, 1.

National Marine Fisheries Service (2015) *Fisheries of the United States, 2014.* U.S. Department of Commerce, NOAA Current Fishery Statistics No.2014. Retreived from: https://st.nmfs.noaa.gov/commercial-fisheries/fus/fus14/index.

Oken, E., Choi, A. L., Karagas, M. R., Mariën, K., Rheinberger, C. M., Schoeny, R., & Korrick, S. (2012). Which fish should I eat? Perspectives influencing fish consumption choices. *Environmental health perspectives*, 120(6), 790.

Olson, J., Clay, P. M., & da Silva, P. P. (2014). Putting the seafood in sustainable food systems. *Marine Policy*, 43, 104-111.

Reese, J. (2013). Assessing interest in sustainable seafood through strategically framed interpretive statements. *Journal of Interpretation Research*, *18*(1), 7-22.

Scheufele, D. A. (1999). Framing as a theory of media effects. *Journal of communication*, 49(1), 103-122.

Scheufele, D. A., & Tewksbury, D. (2007). Framing, agenda setting, and priming: The evolution of three media effects models. *Journal of communication*, 57(1), 9-20.

Schultz, P. W., & Zelezny, L. (2003). Reframing environmental messages to be congruent with American values. *Human ecology review*, *10*(2), 126-136.

Seafood Watch website (2016). Retreived from: https://www.seafoodwatch.org.

Smith, C. (1992). Media and apocalypse: News coverage of the Yellowstone forest fires, Exxon Valdez oil spill, and Loma Prieta earthquake (Vol. 36). Greenwood Publishing Group.

Soroka, S. N. (2002). Issue Attributes and Agenda-Setting by Media, the Public, and Policymakers in Canada. *International Journal of Public Opinion Research*, 14(3), 264-285.

Steel, B. S., Smith, C., Opsommer, L., Curiel, S., & Warner-Steel, R. (2005a). Public ocean literacy in the United States. *Ocean & Coastal Management*, 48(2), 97-114.

Steel, B., Lovrich, N., Lach, D., & Fomenko, V. (2005b). Correlates and consequences of public knowledge concerning ocean fisheries management.*Coastal Management*, *33*(1), 37-51.

Sylwester, J. G. (2014). Fishers of men: the neglected effects of environmental depletion on labor trafficking in the Thai fishing industry. *Pac. Rim L. & Pol'y J.*, 23, 423.

Tuu, H. H., Olsen, S. O., Thao, D. T., & Anh, N. T. K. (2008). The role of norms in explaining attitudes, intention and consumption of a common food (fish) in Vietnam. *Appetite*, *51*(3), 546-551.

Ungar, S. (1992). The rise and (relative) decline of global warming as a social problem. The *Sociological Quarterly*, 33(4), 483-501.

Verbeke, W., & Vackier, I. (2005). Individual determinants of fish consumption: application of the theory of planned behaviour. *Appetite*, 44(1), 67-82.

Vilella-Vila, M., & Costa-Font, J. (2008). Press media reporting effects on risk perceptions and attitudes towards genetically modified (GM) food. *The Journal of Socio-Economics*, 37(5), 2095-2106.

Widener, P., & Gunter, V. J. (2007). Oil spill recovery in the media: Missing an Alaska Native perspective. *Society and Natural Resources*, *20*(9), 767-783.

Wilson, K. M. (1995). Mass media as sources of global warming knowledge. *Mass Communication Review*, 22, 75-89.

Yadavalli, A., & Jones, K. (2014). Does media influence consumer demand? The case of lean finely textured beef in the United States. *Food Policy*, 49, 219-227.

APPENDIX A

ARTICLE CODEBOOK

1) **Newspaper name**:
   a. New York Times
   b. Washington Post
   c. Los Angeles Times
   d. Wall Street Journal
   e. USA Today
2) **Title of article**: Write exact title
3) **Date of publication**: Indicate data of publication by month, date, and year
4) **Author**: Last name, first name
5) **Number of words**: Write number of words
6) **Type of article**: Feature, editorial, blog post, etc.
7) **Location of article**: Which location is being discussed; use the same degree of specificity as the article uses
8) **Article subject(s):**
   a. Salmon
   b. Tuna
   c. Shrimp
   d. Seafood
   e. Fisheries
9) **Scope of interest**: Which level of interest does the article focus on? (note: you may indicate more than one level)
   a. Local/city
   b. State
   d. National
   e. International
10) **Sources of information**: Which interests groups do the authors of the articles cite when providing information? May be named specifically (e.g. "Jon Stewart says…") or referenced generally (e.g. "comedians say…"). Highlight name, affiliation, and information provided.
   a. Fishermen
   b. Seafood companies
   c. Aquaculture
   d. Fish retailors
   e. Government
   f. Expert
   g. University academic
   h. Research group
   i. Media
   j. Citizens
   k. Environmental groups
   l. Human health
   m. Energy and natural resources
11) **Sustainability impacts**: **Environmental**
   a. Environment/ecosystem health
      i. Pollution
      ii. Changing conditions
   b. Marine life health
      i. Commercial species health
      ii. Bycatch
12) **Sustainability impacts: Economic**
   a. Producers
      i. Costs and profits
      ii. Trade and markets
   b. Consumers and the public
      i. Prices
      ii. Jobs and livelihoods
      iv. Ecolabels and seafood guides
13) **Sustainability impacts: Social/political**
   a. Management and regulation
   b. Human health
      i. Contaminants
   c. Seafood modification
   d. Public perceptions
   e. Cultural & technological change
   f. Social justice
14) **Solutions**:
   a. Elective: Potential
   b. Elective: Actual
   c. Mandatory: Potential
   d. Mandatory: Actual

Sustainability Impacts: Environmental

Environmental/ecosystem health

Description	Impacts pertaining to the environment or ecosystem as a whole; subcategories include pollution, habitat destruction, changing conditions
Inclusion Criteria	Any impacts to the environment as a whole that don't fit into the pollution, habitat destruction, or changing conditions categories
Exclusion Criteria	Pollution, habitat destruction, or changing conditions
Typical Exemplars	• In an April assessment, the Environmental Protection Agency found that this mine could devastate Bristol Bay's salmon runs, laying waste to as much as 90 miles of streams, vital habitat for wild sockeye, coho and chinook.
Atypical Exemplars	
Close but no	

Pollution (Environmental/ecosystem health)

Description	Pollution that affects the marine environment
Inclusion Criteria	Pollution from fish farming, oil spills, trash that is discarded into the ocean, agricultural waste, human waste
Exclusion Criteria	Toxin build-ups in fish (code under "toxicants"); carbon dioxide pollution or ocean acidification from climate change (code under "changing conditions")
Typical Exemplars	• Moreover, early shrimp farms were in open-air ponds or near the coast, and sometimes released effluent into sensitive ocean habitats. • Four years after an estimated 4 million barrels of oil burst into the gulf, biologists still do not know how many fish were killed or mortally damaged.
Atypical Exemplars	• Mr. Skinner attributed the lack of large brown shrimp in Mobile Bay to the normal seasonal migration; by now, he said, the shrimp would have already moved out into the federally controlled waters of the Gulf of Mexico. In Alabama, those are still closed due to the oil. (*reference to oil in the water*) • Even using the most modern mining technology, the study said, polluted water from the mine site could affect fish in up to 51 miles of streams. (*code in both "pollution" and "commercial species health"*)
Close but no	

Changing conditions (Environmental/ecosystem health)

Description	
Inclusion Criteria	Climate change, warming waters, ocean acidification, changing temperatures, prevalence of storms
Exclusion Criteria	
Typical Exemplars	• As the ocean absorbs more carbon dioxide and becomes more acidic, corals and shellfish are increasingly endangered. • "The drought conditions have caused lower flows in the rivers, warmer water temperatures, and the fish that would normally be swimming down the rivers would be very susceptible to predation and thermal stress," said Kari Burr, fishery biologist with the Fishery Foundation of California.
Atypical Exemplars	• Below the deceptively sunny surface of the tropical sea, the loss of social shrimp is only the latest signal of a global ocean ecosystem on the brink of profound change.
Close but no	

Marine life health

Description	The health of marine life
Inclusion Criteria	Pertaining to the health of all life in the oceans
Exclusion Criteria	Environmental health factors (warming waters, habitat destruction, etc.)
Typical Exemplars	• Coral reefs are dying at our own hands. The murder weapons - fossil fuel consumption and food production - are the basic engines of human economic growth.
Atypical Exemplars	
Close but no	

Commercial species health (Marine life health)

Description	The abundance and health of commercial seafood species
Inclusion Criteria	Overfishing, decline in population numbers, interbreeding with genetically modified organisms (for human health effects of GMOs, see “Social: human health”)
Exclusion Criteria	Specific instances of an individual animal’s health (code under “individual fish health”)
Typical Exemplars	• This virus, known to spread easily and to be associated with a disease that weakens the heart muscles of salmon, has been identified in nearly all farmed salmon raised and sold in British Columbia. • American regulators called off this year's Gulf of Maine shrimping season after research suggested that

	overfishing and warming waters had driven shrimp stocks to new lows.
Atypical Exemplars	• The idea is to prevent cross-breeding with wild fish. Most farmed salmon are kept in ocean pens, where wild and confined fish can infect each other with disease -- and where escapees can join the gene pool, producing offspring less suited to the open ocean. • "Because that imprinting cycle is broken, it's unlikely that many fish will make it back to Coleman. In other words, they stray. They won't find that scent to where home is," said Scott Hamelberg, who manages the Coleman National Fish Hatchery. • Even using the most modern mining technology, the study said, polluted water from the mine site could affect fish in up to 51 miles of streams. (*code in both "pollution" and "commercial species health"*)
Close but no	

Bycatch (Marine life health)

Description	Bycatch refers to animals that are accidentally caught during the fishing process
Inclusion Criteria	Reference to marine creatures that are accidentally caught during the fishing process
Exclusion Criteria	Damage done to habitats or plants (such as damage done to coral reefs, which would be coded under "marine life health")
Typical Exemplars	• The fishing method must not snag large numbers of unintended species, a result known as bycatch. • Dolphins in particular have proven to be a significant bycatch in tuna fishing. • There is no sure way to catch tuna without harming other marine life. Dolphins, as well as sharks, turtles and other animals, are unintentionally killed as bycatch in the quest for tuna. • The bycatch includes endangered sea turtles, blue and white marlin and severely depleted western Atlantic bluefin tuna.
Atypical Exemplars	
Close but no	

Sustainability Impacts: Economic	

Producers

Description	The economic considerations and impacts on the producer side
Inclusion Criteria	All production-related economic concerns that are not listed in a subcategory
Exclusion Criteria	All concerns relating to consumers or the general public; all concerns that are listed specifically in other categories (costs and profits, trade, markets)
Typical Exemplars	
Atypical Exemplars	
Close but no	

Costs and Profits (Producers)

Description	The cost of operation for fishing businesses and the profit gained or lost from the sale of seafood
Inclusion Criteria	Mention of costs for producers, such as costs to business owners, fishermen, governments; use of the word "cost"; mention of how much a product is "worth"; discussion of total sales or profits for a company
Exclusion Criteria	Mention of price (code under "prices")
Typical Exemplars	• The cost of catching and selling shrimp is too high for American fishermen to make a decent living. • A state-owned utility that supplies power to about 2 million South Carolina residents is contesting a study that could require it to spend more than $130 million to build devices to allow an endangered fish species to swim from the sea to its spawning grounds above two dams. • Shrimp alone in Louisiana is worth more than $100 million a year. • "It takes like 50 or 60 shrimp to make a pound, and that's real small to sell retail," Mr. Skinner, 56, who owns Skinner's Seafood, said in a telephone interview.
Atypical Exemplars	• Mr. Alfonso would customarily spend $800 on ice and diesel, but he had spent only half that, because he was unsure what the return on his investment would be. • One bright spot for seafood producers is that scarcity has driven up prices. (*even though it uses the word "prices", it is specifically referencing how producers benefit from this*)
Close but no	

Trade and markets (Producers)

Description	Impacts on the exchange of goods between different markets
Inclusion Criteria	Imported vs. exported seafood, discussions of "domestic" or "American" seafood, supply and demand, competition, functionality of the system, overall sales associated with seafood
Exclusion Criteria	
Typical Exemplars	• The combination of falling local tuna supplies, which has forced the U.S. to import more and more of its tuna, and rising demand abroad, which has strained the global supply, has pushed domestic prices upwards. • "The U.S. shouldn't be importing shrimp when we can make our own," Ms. Brown said. "We ship our shrimp out so fresh, their legs are still kicking when they go out the door."
Atypical Exemplars	• In a test run on Friday, shrimpers found no sign of oil on their nets or shrimp, Mr. Smith said, but shrimpers had trouble finding buyers.
Close but no	

Consumers and the public

Description	The economic considerations and impacts from the consumer and public perspectives
Inclusion Criteria	All consumer-related economic concerns that are not listed in a subcategory
Exclusion Criteria	All concerns relating to production; all concerns that are listed specifically in other categories (jobs and livelihoods, prices, ecolabels and seafood guides)
Typical Exemplars	
Atypical Exemplars	
Close but no	

Jobs and Livelihoods (Consumers and the public)

Description	Jobs related to the fishing industry; the ability of people to make a living in the fishing industry
Inclusion Criteria	Mention of fishermen and other people whose jobs depend on fishing or farming, either directly or indirectly; references to fishermen and their ability to continue working in the industry; use of the word "livelihood"
Exclusion Criteria	References to jobs that are not dependent on fisheries; saying that it is "somebody's job" to do something
Typical Exemplars	• Fisheries officials estimate that doubling American aquaculture production could create 50,000 jobs and more than $1 billion in revenue for farmers.

	• All of this demonstrates just how hard it has become to make a living on shrimp boats, said David Veal, the executive director of the American Shrimp Processors Association.
Atypical Exemplars Close but no	

Prices (Consumers and the public)

Description	The price of purchasing fish
Inclusion Criteria	Mention of costs for consumers, use of the word "price"; specifically aimed at identifying the relationship between price and consumers
Exclusion Criteria	
Typical Exemplars	• Shrimp prices spiked after the oil spill began because customers were worried about running out, but they have been falling rapidly since mid-June, according to Urner Barry, a company that tracks market data. • One of the most compelling marketing initiatives launched early on by the tuna industry was the fish's relatively affordable price. "They advertised the low cost of tuna compared to salmon, tuna's number one competitor," Smith said. "But the price of tuna has gone up. If you look at cans, they sell for the same amount but with less tuna by weight."
Atypical Exemplars Close but no	

Ecolabels and seafood guides (Consumers and the public)

Description	Ecolabels and seafood guides that help consumers choose sustainable seafood
Inclusion Criteria	Use of the word "ecolabel", reference to a particular sustainable seafood guide (such as Seafood Watch), reference to recommendations for seafood based on sustainability or health considerations
Exclusion Criteria	General discussions of labeling (e.g. species, country of origin, GMO)
Typical Exemplars	• But even today, and even with dolphin-safe labels, the potential for bycatch persists. Many doubt whether dolphin-safe labels even guarantee that no dolphins were harmed in the process.
Atypical Exemplars	

Close but no	• Eric Schwaab, who served as NOAA's assistant administrator for fisheries during President Obama's first term and now works as the chief conservation officer at the National Aquarium in Baltimore, said cracking down on falsely labeled seafood is especially important because nearly 90 percent of American seafood is imported.

Labeling (Consumers and the public)

Description	Labeling of fish for species, country of origin, GMO
Inclusion Criteria	Discussion of labels on seafood
Exclusion Criteria	Ecolabels or seafood guides that are intended for consumers to make environmentally-friendly purchases
Typical Exemplars	• Eric Schwaab, who served as NOAA's assistant administrator for fisheries during President Obama's first term and now works as the chief conservation officer at the National Aquarium in Baltimore, said cracking down on falsely labeled seafood is especially important because nearly 90 percent of American seafood is imported.
Atypical Exemplars	
Close but no	• But even today, and even with dolphin-safe labels, the potential for bycatch persists. Many doubt whether dolphin-safe labels even guarantee that no dolphins were harmed in the process.

Sustainability Impacts: Social

Management and regulation

Description	Discussion of how to manage fisheries and seafood markets
Inclusion Criteria	Discussion of the laws, policies, decision-making processes, and collaborations in place and their efficacy
Exclusion Criteria	Suggested management and regulation policies should be coded under “suggested solutions”
Typical Exemplars	• As fishermen are sidelined, taking their boats out of service for lack of work, New England's marine industry that repairs, stores and cleans boats is next in line to feel the hit. Wilcox, owner of Wilcox Marine Supply, blames the federal government and the fishing limits it has imposed. • Finally, the fishery must be well managed. For example, if a particular species is sensitive to overfishing, the managers must have the capacity to adjust their take on a monthly or yearly basis.

Atypical Exemplars	• Since nearly 4 of 10 oysters eaten in the United States come from Louisiana, shortages are inevitable if the closures persist, oyster farmers say.
Close but no	• "We recognize that the effects of the oil spill continue to grow as oil continues to flow," NOAA administrator Jane Lubchenco said Monday. "As remediation efforts continue, it may be possible to alleviate some of the economic harm caused by the oil spill by reopening previously closed areas." (*code under "suggested solutions"*)

Public perceptions

Description	How cultural perceptions of seafood and sustainability impact fisheries
Inclusion Criteria	Discussion of how people view seafood, companies, or the fishing industry, and the impacts of these perceptions
Exclusion Criteria	
Typical Exemplars	• For the moment, shrimp industry officials are more worried about the consumer confidence that underlies a whole network of fishermen, ice makers, processors and distributors.
Atypical Exemplars	• "The brand itself has been damaged," said Ewell Smith, the executive director of the Louisiana Seafood Promotion and Marketing Board. "Every time they show the image on TV of the spill, people are thinking we don't have safe seafood and that we are out of seafood."
Close but no	

Cultural and technological change

Description	The impact of changing cultural practices and technologies on seafood sustainability
Inclusion Criteria	Mention of historical situations and how our society has changed; mention of new technologies and their impacts
Exclusion Criteria	
Typical Exemplars	• The salmon provide food for brown bears, bald eagles and wolves. And they're the centerpiece of sustenance and culture for native peoples who have lived there for thousands of years. • "It could become where Louisiana shrimp and crab are like caviar," Walker said. The shrimp burger, one of the dishes on the menu in which the men take the most pride, "could be something of history."
Atypical Exemplars	
Close but no	

Human Health

Description	How fish consumption, fish farming, or fishing practices impact an individual's health
Inclusion Criteria	
Exclusion Criteria	
Typical Exemplars	• Repeated studies have shown gulf seafood is safe to eat, a fact trumpeted by industry representatives and government officials, who launched a gulf seafood safety Web site last week to reassure consumers. • Instead, the panel offered a series of recommendations aimed at fleshing out information, including the possibility that the fish could trigger allergies or other health problems in some consumers. • The tuna industry also touted the fish's many health benefits - specifically the fact that it was high in protein and low in fat - pointed to its low price point, and shared recipes for casseroles, salads and sandwiches on labels and flyers.
Atypical Exemplars	
Close but no	

Contaminants (Human health)

Description	Concerns about toxins and chemicals affecting the safety of consuming seafood
Inclusion Criteria	Toxin build-ups in fish (such as mercury) or chemical contaminants (such as oil spills)
Exclusion Criteria	Hormones, antibiotics, and GMOs have their own category
Typical Exemplars	• The Food and Drug Administration said that all seafood samples had tested below the level of concern for health risks from petroleum compounds, and that it was developing a test for dispersants in food. Only 2 of 2,500 water samples have tested positive for dispersants, it said. • Consumers have long feared that fish, oysters and other products could be tainted by oil and chemicals used to fight the spill, although extensive testing has indicated the food is safe.
Atypical Exemplars	
Close but no	

Modified seafood

Description	Concerns about the safety of intentionally modified seafood

Inclusion Criteria	Hormones, antibiotics, GMOs, safety of eating genetically modified fish
Exclusion Criteria	Toxicants and chemical contamination have their own category
Typical Exemplars	• The firm has developed genetically engineered salmon that reach market weight in half the usual time. What's more, it hopes to avoid the pollution, disease and other problems associated with saltwater fish farms by having its salmon raised in inland facilities.
Atypical Exemplars	
Close but no	

Social justice

Description	Impacts on humans
Inclusion Criteria	Slavery; unfair or unsafe working conditions; worker payments; equality issues (class, gender, race, religious, other); human rights
Exclusion Criteria	
Typical Exemplars	• One of the problems with the growth of shrimp farming is increased marginalization of local communities. • Poor working conditions are systemic in the tuna industry, and in the worst cases, human rights violations and slave labor take place. • Recent news reports have alleged the use of slave labor on boats that supply fish meal for shrimp farms in Thailand.
Atypical Exemplars	
Close but no	

Suggested Solutions

Elective: Potential

Description	Potential elective or bottom-up solutions
Inclusion Criteria	Solutions being driven by fishermen, citizens, environmental groups, etc. rather than by the government or big businesses; suggested solutions; attempts to influence government policy; tend to be more voluntary
Exclusion Criteria	Actual, implemented solutions (code under “bottom-up: actual”)
Typical Exemplars	• The rest of us have our own role to play. Americans everywhere need to raise our voices and speak out in support of the people of Bristol Bay. • A campaign is trying to get 12,000 rain gardens in Puget Sound to help reduce water pollution.

Atypical Exemplars	• As Pebble Ltd. Partnership prepares to submit its permit application outlining what kind of mine it wants to build by late this year or early next, Bristol Bay fishermen are fighting a fierce advance assault, hoping to convince government decision-makers and the public that poisonous mine drainage and some of the world's last pristine salmon streams are a combination too risky to contemplate
Close but no	

Elective: Actual

Description	Actual elective or bottom-up solutions
Inclusion Criteria	Solutions being driven by fishermen, citizens, environmental groups, etc. rather than by the government or big businesses; actual, implemented solutions; attempts to influence government policy; tend to be more voluntary
Exclusion Criteria	Potential or suggested solutions (code under "bottom-up: potential")
Typical Exemplars	• In the late 1980s, many consumers responded by boycotting the industry.
Atypical Exemplars	• Two years later, StarKist, Bumble Bee and Chicken of the Sea, the world's largest tuna-canning companies, agreed to stop buying and selling tuna caught in purse-seine nets. (*although they are big businesses, they made voluntary decisions to act together, rather than relying on formal laws*)
Close but no	

Mandatory: Potential

Description	Potential mandatory or top-down solutions
Inclusion Criteria	Solutions that are being driven by powerful entities, such as governments and large businesses, with the ability to enforce laws and rules; potential or suggested solutions; tend to be more mandatory
Exclusion Criteria	Actual or implemented solutions (code under "top-down: actual")
Typical Exemplars	• In response to the WTO ruling, the United States proposed a new rule to strengthen protections for dolphins wherever tuna is fished. • The Obama administration proposed mining restrictions in Alaska on Friday that would protect what the U.S. Environmental Protection Agency described as "one of the world's most valuable salmon fisheries," but which

	critics said could effectively halt development of one of the largest open pit mines on the planet.
Atypical Exemplars	
Close but no	

Mandatory: Actual

Description	Actual mandatory or top-down solutions
Inclusion Criteria	Solutions that are being driven by powerful entities, such as governments and large businesses, with the ability to enforce laws and rules; actual, implemented solutions; tend to be more mandatory
Exclusion Criteria	Potential or suggested solutions (code under "top-down: potential")
Typical Exemplars	• Officials announced Tuesday that they are temporarily waiving an endangered species protection to enable water managers to send more Northern California water south. • Congress blocked tuna fished with purse-seine nets from the U.S. market.
Atypical Exemplars	• But the precautionary closing of oyster beds, shrimping grounds and crab habitats where oil has been spotted has idled most of the fishermen.
Close but no	

APPENDIX B

LIST OF NEWSPAPER ARTICLES IN SAMPLE

NYT = New York Times
LAT = Los Angeles Times
WP = Washington Post
USA = USA Today
WSJ = Wall Street Journal

Code	Title	Date	Author	Source
LAT-salmon01	Fishermen circle boats in Alaska; They worry that a massive mine would destroy some of the world's last pristine salmon streams.	8/4/2010	Murphy, Kim	LAT
LAT-salmon02	Is engineered 'Frankenfish' coming to the nation's table?; AquaBounty seeks approval for salmon that reaches market weight in half the usual time.	8/14/2010	Zajac, Andrew	LAT
LAT-salmon03	Gene-modified salmon safe, FDA report says	9/4/2010	Geiger, Kim	LAT
LAT-salmon04	More study is urged for genetically altered salmon; An FDA advisory panel discusses whether the fish would be safe to eat, but declines to vote.	9/21/2010	Zajac, Andrew	LAT
LAT-salmon05	No agreement near on salmon labeling; FDA hearing is split over who should alert consumers that a fish is genetically altered.	9/22/2010	Zajac, Andrew	LAT
LAT-salmon06	Weighing the super-salmon; The environmental risks need further study before a genetically engineered salmon is marketed.	9/23/2010	Anonymous	LAT
LAT-salmon08	State's salmon fishermen face an upstream struggle; A new chinook season spawns hope but also anxiety: How many fish are left to catch?	6/12/2011	Semuels, Alana	LAT
LAT-salmon09	Experts report holes in Klamath dam plan; Removing the barriers alone won't guarantee a return of Chinook salmon, panel says.	6/25/2011	Boxall, Bettina	LAT
LAT-salmon10	Modified salmon faces resistance; A group of senators is asking the FDA to	7/31/2011	Seidman, Andrew	LAT

	nix the approval process of the genetically altered fish as food.			
LAT-salmon11	Dam gives way for the fish to flow; The breaching of two barriers will allow salmon upriver for the first time in a century.	9/18/2011	Murphy, Kim	LAT
LAT-salmon12	New salmon safeguards ordered; Judge says pumping curbs were based on 'bad science' but finds fish were jeopardized.	9/21/2011	Boxall, Bettina	LAT
LAT-salmon14	EPA says Alaska mine could devastate rivers; The proposed project above Bristol Bay may wipe out fish habitat, the agency says.	3/20/2012	Murphy, Kim	LAT
LAT-salmon15	Northwest fish are back in the water; Wild trout are a sign of success for a massive river restoration project.	7/15/2012	Murphy, Kim	LAT
LAT-salmon16	Decline in Alaska king salmon runs raises worries	7/22/2012	Mauer, Richard	LAT
LAT-salmon17	Genetically engineered salmon clears FDA hurdle	12/22/2012	Mestel, Rosie	LAT
LAT-salmon18	And then there was one; A chinook spawns in a once-dry stretch of the San Joaquin River, a sign of hope waterway's restoration will succeed	3/29/2013	Boxall, Bettina	LAT
LAT-salmon19	Finding a way to raise heartier salmon; Farmers and biologists collaborate to place young fish in flooded rice fields, mimicking the marshlands that once lined rivers.	4/14/2013	Cone, Tracie	LAT
LAT-salmon20	Save Bristol Bay	5/24/2013	Redford, Robert	LAT
LAT-salmon22	EPA report blasts Alaska mine plan	1/16/2014	La Ganga, Maria L	LAT
LAT-salmon23	Amid drought, more salmon to get lift to ocean	3/27/2014	Li, Shan	LAT
LAT-salmon24	Delta pumping limits are eased; State officials	4/2/2014	Boxall, Bettina	LAT

	temporarily waive endangered species protection to send Northern California water south.			
LAT-salmon25	Amid drought, salmon head for a river highway; Fish are moved to the ocean by truck instead of having them take their chances in compromised streams.	6/22/2014	Chea, Terence	LAT
LAT-salmon26	EPA curbs threaten Alaska mine; Limits proposed on Bristol Bay mining plan seek to protect a vital salmon fishery.	7/19/2014	La Ganga, Maria L	LAT
LAT-salmon28	An upstream battle against urban runoff; A Seattle-area experiment finds stormwater pollution is a serious threat to coho salmon.	11/23/2014	Le, Phuong	LAT
NYT-salmon01	Hatched and Wild Salmon: A Bad Mix?	5/16/2012	Slivka, Kelly	NYT
NYT-salmon02	Genetically Altered Salmon Set to Move Closer to Dinner Table	6/26/2010	Pollack, Andrew	NYT
NYT-salmon05	Wild Salmon Are Not Holding Up, Study Shows	2/9/2012	Nuwer, Rachel	NYT
NYT-salmon07	Modified Salmon Is Safe, F.D.A. Says	9/4/2010	Pollack, Andrew	NYT
NYT-salmon08	Panel Leans in Favor Of Engineered Salmon	9/21/2010	Pollack, Andrew	NYT
NYT-salmon09	Betting on a Fish	5/22/2012	Pollack, Andrew	NYT
NYT-salmon11	Virus in Pacific Salmon Raises Worries About Industry	10/29/2011	Ardley, William	NYT
NYT-salmon14	Protecting a 'Wolf' of a Salmon	10/22/2012	Slivka, Kelly	NYT
NYT-salmon15	A Fresh Look at Iron, Plankton, Carbon, Salmon and Ocean Engineering	7/18/2014	Revkin, Andrew	NYT
NYT-salmon16	Killing Sea Lions to Save Salmon, Again	8/25/2011	Barringer, Felicity	NYT
NYT-salmon17	Don't Be Afraid of Genetic Modification	3/10/2013	Anthes, Emily	NYT
NYT-salmon19	A New Way to Track Fish	7/10/2012	Slivka, Kelly	NYT

NYT-salmon21	Relearning How to Eat Fish	8/11/2014	Brody, Jane	NYT
NYT-salmon22	About That Salmon	8/1/2011	Anonymous	NYT
NYT-salmon23	Hearings In Canada On Virus In Salmon	12/16/2011	Ardley, William	NYT
NYT-salmon25	Native Alaska, Under Threat	6/28/2013	Chythlook-Sifsof, Callan	NYT
NYT-salmon26	A Coho Salmon's Journey	3/29/2012	Frank, Aliette	NYT
NYT-salmon27	Removing Barriers To Salmon Migration	7/30/2011	Ardley, William	NYT
NYT-salmon28	One Fish, Two Fish, Dead Fish, New Fish	10/7/2012	Bosman, Julie	NYT
NYT-salmon29	Hopes for a Fish Revival As a Dam Is Demolished	7/26/2013	Bidgood, Jess	NYT
NYT-salmon30	The Sockeye's Secret Compass	2/7/2013	Foster, Joanna	NYT
WP-salmon01	FDA nears approval as food of genetically altered salmon	9/7/2010	Layton, Lyndsey	WP
WP-salmon02	Some major retailers reject transgenic fish	10/19/2013	Dennis, Brady	WP
WP-salmon03	W.Va. researchers test practicality of tank-farmed salmon	4/23/2014	Pipkin, Whitney	WP
WP-salmon04	FDA rules won't require salmon labels	9/19/2010	Layton, Lyndsey	WP
WP-salmon05	Hundreds of salmon stranded in ditches in Calif.	8/19/2013	Weiser, Matt	WP
WP-salmon06	Fears over modified salmon voiced	9/21/2010	Layton, Lyndsey	WP
WP-salmon07	Mining in Alaska bay will harm salmon, EPA says	5/19/2012	Eilperin, Juliet	WP
WP-salmon08	Where to find responsibly farmed salmon	9/25/2013	Anonymous	WP
WP-salmon09	It's good to eat fish, especially if you choose where it comes from	11/20/2012	Butler, Carolyn	WP
WP-salmon10	Senators want review of modified salmon ended	9/29/2010	Layton, Lyndsey	WP
WP-salmon11	Obama bans drilling in Alaska's Bristol Bay, citing risk to salmon fishery	12/17/2014	Warrick, Joby	WP
USA-salmon01	A better diet helps put ocean-farmed salmon on the 'eco-friendly' fish list;	8/27/2013	Weise, Elizabeth	USA

	More omega-3 fatty acids in feed let species thrive			
USA-salmon02	Farmed salmon industry seeks sustainability; Major producers unite to solve common issues	3/21/2014	Weintraub, Karen	USA
USA-salmon03	Sockeye making a big comeback	9/19/2014	Ridler, Keith	USA
USA-salmon04	Salmon take a shortcut to the sea	6/16/2014	Anonymous	USA
USA-salmon05	Don't harm fish to help Big Ag	4/20/2015	McManus, John	USA
USA-salmon06	Fishy fakes common in stores, restaurants; Study: High-priced seafood often not what you think	2/21/2013	Weise, Elizabeth	USA
USA-salmon07	Go fishin' for 8 ounces a week; Don't let the 'bad rap' spoil all of the benefits	3/30/2011	Healy, Michelle	USA
USA-salmon08	Exxon Valdez spill's lessons resurface; 25 years later, questions linger over Arctic drilling	3/25/2014	Koch, Wendy	USA
USA-salmon10	Fish oil's a smart bet; It can help boost brain and heart health, studies say	2/6/2014	Hellmich, Nanci	USA
USA-salmon11	Seafood diet may keep vision loss at bay; Omega-3s might stall macular degeneration	12/2/2010	Brophy Marcus, Mary	USA
WSJ-salmon01	Gene-Altered Fish Close to Approval	9/21/2010	Naik, Gautam	WSJ
WSJ-salmon02	To Label or Not Label Lab-Spawned Salmon	9/21/2010	Corbett Dooren, Jennifer	WSJ
WSJ-salmon03	FDA Panel Supportive of Gene-Altered Salmon, but More Research Needed	9/21/2010	Tomson, Bill	WSJ
WSJ-salmon04	Don't Be Afraid of Frankenfish; Genetically engineered salmon will meet growing demand for protein-rich food without depleting wild fish stocks.	9/22/2010	Greenwood, James	WSJ
WSJ-salmon06	Industry Fights Altered Salmon	10/1/2010	Mundy, Alicia; Tomson, Bill	WSJ
WSJ-salmon08	Swimming in Salmon; An unexpectedly large run of	2/7/2011	Anonymous	WSJ

	salmon in the rivers of far Northern California this winter is providing an economic boost to local communities across the hard-hit region.			
WSJ-salmon09	Big Salmon Run Spawns Profits	2/7/2011	Scheck, Justin	WSJ
WSJ-salmon11	Sea Lions Turn Salmon Run Into Buffet; Feeding Frenzy at Columbia River's Bonneville Dam Becomes Federal Case Weighing the Fate of Two Protected Species	5/23/2011	Millman, Joel	WSJ
WSJ-salmon12	U.S. News: Salmon-Eating Sea Lions Get Their Day in Court	5/16/2012	Millman, Joel	WSJ
WSJ-salmon13	Royal Pain: Alaska Missing Its King Salmon; Disastrous Decline in Seasonal Migration Threatens Commercial Catch, Forces Closing of Kenai River to Fishing Guides	8/3/2012	Carlton, Jim	WSJ
WSJ-salmon14	For Salmon, Magnetic Fields Point the Way	2/8/2013	Hotz, Robert Lee	WSJ
WSJ-salmon15	EPA Critical of Alaska Pebble Mine Project; Project Could Have 'Significant' Impact on Salmon, Native Communities	1/15/2014	Mundy, Alicia	WSJ
WSJ-salmon16	Fish Farmers Hunt for Cleaner Waters	4/19/2014	Jervell, Ellen Emmerentze	WSJ
WSJ-salmon17	Drought-Stricken California Farmers Fight Release of Water for Fish; Effort to Protect Klamath River Salmon Is Backed by Environmentalists, Tribes and Fishermen	8/27/2014	Carlton, Jim	WSJ
WSJ-salmon18	Top Chefs, Grocers Choose Farmed Salmon; Even Fish Snobs Are Ordering Better-Tasting Varieties From New Sources	9/24/2014	Nassauer, Sarah	WSJ

WSJ-salmon22	Russian Crisis Is Tiny Islands' Bonanza --- Amid sanctions, Faeroes reap windfall on salmon exports	2/21/2015	Troianovski, Anton	WSJ
LAT-tuna01	Fish in Pacific are ingesting plastic debris, study finds	3/11/2011	Barboza, Tony	LAT
LAT-tuna02	A YEAR LATER: PORTRAITS FROM THE GULF; PEACE MARVEL; Fish return, but his sportfishing business founders	4/17/2011	Sahagun, Louis	LAT
LAT-tuna03	Fish's protected status denied	5/28/2011	Anonymous	LAT
LAT-tuna04	Tuna helpers; Off Baja, fish ranchers take on the tricky task of raising the treasured but depleted bluefin.	7/21/2011	Yamaguchi, Adam; Slobig, Zach	LAT
LAT-tuna05	U.S. tuna labels are ruled too restrictive	9/16/2011	Anonymous	LAT
LAT-tuna06	Three tuna packers agree to settle case in California	8/4/2012	Anonymous	LAT
LAT-tuna07	Oil spills are linked to fish heart troubles; A study of the effects of the BP disaster on bluefin tuna finds irregularities that can lead to cardiac arrest.	2/14/2014	Sahagun, Louis	LAT
LAT-tuna08	THE NATION; Obama orders ocean protections; Measures target pollution, overfishing and acidification. The plan would also preserve a greater stretch of the Pacific.	6/18/2014	Banerjee, Neela	LAT
LAT-tuna09	Warmer waters detected off Central Coast; Tuna and yellowtail are moving closer to shore, increasing potential catches.	8/12/2014	Boxall, Bettina; Rocha, Veronica	LAT
LAT-tuna10	Japan scientists turn to surrogate fish for overfished tuna; The process uses mackerel to spawn bluefish tuna, which would replenish stocks and ensure diversity.	11/23/2014	Kurtenbach, Elaine	LAT
LAT-tuna11	Seafood giant hooks Bumble Bee; Thai Union Frozen	12/20/2014	Khouri, Andrew	LAT

	Products is paying $1.51 billion for the San Diego firm.			
LAT-tuna12	Tuna mercury levels called 'concerning'	2/6/2015	Mohan, Geoffrey	LAT
NYT-tuna01	Time to Boycott Tuna Again?	9/20/2011	Bittman, Mark	NYT
NYT-tuna02	Officials: No Need to Protect Bluefin Tuna Under Species Act	5/27/2011	Revkin, Andrew	NYT
NYT-tuna03	Industry Flouts Bluefin Catch Limits, Study Says	10/18/2011	Jolly, David	NYT
NYT-tuna05	Blue Marlin and Tuna at Grave Risk, Group Warns	7/7/2011	Jolly, David	NYT
NYT-tuna06	Getting Bluefin Tuna Off the Hook	9/18/2012	Slivka, Kelly	NYT
NYT-tuna07	Ruling May Jeopardize 'Safe Dolphin' Label	9/15/2011	Kaufman, Leslie	NYT
NYT-tuna08	F.A.D.-Free Tuna Comes to Safeway - Affordably	10/2/2012	Bittman, Mark	NYT
NYT-tuna09	Endangered-Species Status Is Sought for Bluefin Tuna	6/24/2010	Lehren, Andrew and Gillis, Justin	NYT
NYT-tuna10	Oxymorons of 'Sustainable Overfishing'	12/11/2012	Rosenblum, Mort	NYT
NYT-tuna11	As Regulators Meet, Fishing Boats Thumb Their Noses	6/1/2012	Jolly, David	NYT
NYT-tuna12	Taming the Wild Tuna	9/5/2010	Greenberg, Paul	NYT
NYT-tuna13	Commission Raises Quota for Bluefin Tuna in Atlantic	11/18/2014	The Associated Press	NYT
NYT-tuna14	Pacific Tuna Stocks Have Plummeted, Scientists Warn	1/10/2013	Jolly, David	NYT
NYT-tuna16	Giving up Tuna? Breathing Is Next	6/11/2013	Bittman, Mark	NYT
NYT-tuna19	Group Votes to Keep Fishing Levels of Bluefin Tuna Stable	11/28/2010	Jolly, David	NYT
USA-tuna01	Group: Get tuna out of schools	9/20/2012	Weise, Elizabeth	USA
USA-tuna02	Nothing fishy about seafood; Healthful meals can be quick and simple	12/14/2011	Krieger, Ellie	USA
WSJ-tuna01	Tuna Fight Muddies Waters Over Damage From BP Spill	1/13/2011	Ball, Jeffrey	WSJ
WSJ-tuna02	Atlantic Bluefin Tuna Won't Get Endangered Species Listing	5/27/2011	Ball, Jeffrey; Tracy, Tennille	WSJ

WSJ-tuna03	World News: WTO Sides With Mexico in Long U.S. Tuna Battle	6/20/2011	Guerrero, Jean	WSJ
WSJ-tuna06	Bluefin Tuna Thrive Despite Oil Spill	12/6/2011	Naik, Gautam; Koppel, Nathan	WSJ
WSJ-tuna07	U.S. to Appeal Dolphin-Safe Tuna Ruling	1/20/2012	Barkley, Tom	WSJ
WSJ-tuna08	Tuna Blamed in Salmonella Outbreak Is Recalled	4/16/2012	Tomson, Bill	WSJ
WSJ-tuna09	Tuna Carried Fukushima Radioactivity to U.S. Coast	5/28/2012	Hotz, Robert Lee	WSJ
WSJ-tuna10	Illnesses Continue From Contaminated Tuna	6/22/2012	Tomson, Bill	WSJ
WSJ-tuna11	Bumble Bee Expands Tuna Recall for Seal Tightness	3/8/2013	Chaudhuri, Saabira	WSJ
WSJ-tuna12	The Great Pacific Tuna Cartel; With China's support, eight remote island states have imposed fishing limits and closed international waters.	3/21/2013	Walter, David	WSJ
WSJ-tuna13	Tuna Firms Jostle for Uncle Sam's Recognition; Bumble Bee, Chicken of the Sea Press for Easing of School-Lunch Program Rules	2/17/2014	Hagerty, James R	WSJ
WSJ-tuna17	Taming the Wild Tuna: More Fish Make the Leap From Farm to Table	11/15/2014	Hayashi, Yuka	WSJ
WSJ-tuna18	Bumble Bee to Merge With Chicken of the Sea; Tuna Rivals Strike $1.5 Billion Deal to Create Global Giant	12/19/2014	Chaichalearmmongkol, Nopparat; Beckerman, Josh	WSJ
WSJ-tuna19	Tuna Brands Could Merge After Thai Union Deal; Bumble Bee CEO Says Tie-Up With Competitor Chicken of the Sea Possible	12/22/2014	DiPietro, Ben	WSJ
WP-tuna01	How America fell out of love with canned tuna	8/18/2014	Ferdman, Roberto	WP
WP-tuna02	Catching tuna, not dolphins	5/13/2013	Fears, Darryl	WP
WP-tuna03	The world's biggest canned tuna company is about to get a lot bigger; American canned tuna industry is now pretty much entirely Asian-owned.	12/19/2014	Ferdman, Roberto	WP

WP-tuna04	Tuna, meat labels face international challenges	1/11/2012	Carman, Tim	WP
WP-tuna05	A plan to get bluefin tuna off the hook	11/4/2013	Bernstein, Lenny	WP
WP-tuna06	Gulf spill still imperils tuna, other species	3/25/2014	Fears, Darryl	WP
WP-tuna07	Atlantic Ocean sharks get new protections	11/28/2010	Eilperin, Juliet	WP
WP-tuna08	Consumer Reports: Pregnant women should 'avoid all tuna'; Fish can be a great source of lean protein and omega-3 fatty acids -- and mercury.	8/21/2014	Sullivan, Gail	WP
WP-tuna09	Bluefin tuna not endangered, NOAA rules	5/28/2011	Fears, Darryl	WP
WP-tuna10	Tuna linked to salmonella outbreak in the District, 20 states	4/14/2012	Lester, Will	WP
WP-tuna14	Salmonella outbreak linked to raw tuna sushi spreads to nine states	5/22/2015	Bever, Lindsey	WP
WP-tuna15	Young women and children urged to eat low-mercury fish	7/11/2014	Dennis, Brady	WP
LAT-shrimp03	Fishermen hooked to BP; Seafood grounds have largely reopened, but many cleanup workers aren't ready to ditch the steady pay.	8/7/2010	Sahagun, Louis	LAT
LAT-shrimp04	Saving invertebrates takes some backbone; A Florida man is determined to protect mollusks, shrimp and crabs from oil spill.	8/12/2010	Semuels, Alana	LAT
LAT-shrimp05	This shrimp goes fine with oil; A Louisiana town celebrates the region's top two industries: 'We still need both.'	9/6/2010	Fausset, Richard	LAT
LAT-shrimp06	FOREIGN EXCHANGE; Shrimping is an indoor sport in urban Taiwan; Catching crustaceans over a beer or two is a popular outing	10/1/2012	Jennings, Ralph	LAT
LAT-shrimp07	Shrimp prices soar as a disease crimps supply	8/17/2013	Pierson, David	LAT

LAT-shrimp08	Thailand's slavery trade	6/24/2014	Anonymous	LAT
LAT-shrimp09	CALIFORNIA; Vernal pools at Costa Mesa park threatened; Federal report urges city to restrict public access to endangered shrimp habitat.	7/31/2014	Zint, Bradley	LAT
LAT-shrimp10	Oyster bed pesticide raises concerns; Washington state approves neurotoxin to control shrimp, but agencies warn of risk.	5/3/2015	Anonymous	LAT
NYT-shrimp01	Shrimp's New Path to the Plate	7/3/2014	Tabuchi, Hiroko	NYT
NYT-shrimp02	Questions Linger as Shrimp Season Opens in Gulf	8/17/2010	Dewan, Shaila	NYT
NYT-shrimp03	A Son of the Bayou, Torn Over the Shrimping Life	1/7/2011	Harmon, Amy	NYT
NYT-shrimp04	Gulf Shrimp Are Scarce This Season; Answers, Too	10/11/2011	Robertson, Campbell	NYT
NYT-shrimp06	In Caribbean Reefs, Social Shrimp Disappear	7/24/2012	Duffy, J. Emmett	NYT
NYT-shrimp07	Why Are We Importing Our Own Fish?	6/22/2014	Greenberg, Paul	NYT
NYT-shrimp08	Slow Start to an Oil-Delayed Shrimping Season	8/1/2010	Robbins, Liz	NYT
NYT-shrimp09	Fishermen Wait on Docks As Oil Gushes	6/3/2010	McKinley, James	NYT
NYT-shrimp10	Maine: Shrimp Season Is Called Off	12/4/2013	Bidgood, Jess	NYT
USA-shrimp01	First catch from the Gulf: Is the seafood safe?; Concerns remain as waters open after spill	8/24/2010	Jervis, Rick	USA
USA-shrimp02	Asian tiger shrimp spread in U.S.; Ecosystems at risk as population of invaders grows	5/8/2012	Jervis, Rick	USA
USA-shrimp03	Talks on shrimp season signal comeback for fishermen	8/3/2010	Weise, Elizabeth	USA
USA-shrimp04	Protecting Gulf seafood from oil spill; No-fishing zone spreads	6/4/2010	Schmit, Julie	USA
USA-shrimp05	La. marshes damaged but surprisingly resilient;	8/2/2010	Jervis, Rick	USA

	Scientists, fishermen see hope for rebound			
USA-shrimp06	Oil spill disrupts seafood industry along Gulf Coast; Falling supply, demand hurt businesses	10/8/2010	Jervis, Rick	USA
WSJ-shrimp01	Impact on Seafood Prices Is Limited	6/20/2010	Zhao, Emmeline	WSJ
WSJ-shrimp02	Louisiana Pushes BP for Fisherman Aid	7/11/2010	Hudson, Kris	WSJ
WSJ-shrimp03	Thousands of Islands, Many Fish; Indonesia Modernizes Its Infrastructure as Part of an Effort to Dominate the Global Seafood Market	4/18/2011	Bellman, Eric	WSJ
WSJ-shrimp05	Disease Kills Shrimp Output, Pushes U.S. Prices Higher	7/12/2013	Chaichalearmmongkol, Nopparat; Jargon, Julie	WSJ
WSJ-shrimp06	Gulf Shrimpers Taste Victory	8/13/2013	Mauldin, William	WSJ
WSJ-shrimp07	Shrimp Raise Big Question: Friend or Foe?; Invasive Asian Tiger Species, Now in the U.S., Has Scientists Worried About Ecosystem	9/6/2013	McWhirter, Cameron	WSJ
WSJ-shrimp08	U.S. Panel Says Gulf Shrimp Producers Unhurt by Foreign Subsidies; Decision Prevents Imposition of Import Duties	9/20/2013	Mauldin, William	WSJ
WSJ-shrimp10	Thai Fishery Sector Denies Labor Abuses; Allegations of Child and Forced Labor Pose New Challenge to Country's Shrimp Industry	6/24/2014	Chaichalearmmongkol, Nopparat	WSJ
WP-shrimp01	The shrimp you're buying isn't always what it claims to be; A study tested shrimp sold around the United States, and a lot of it was mislabeled.	11/16/2014	Ferdman, Roberto	WP
WP-shrimp02	That gulf shrimp? It may be from foreign shores.	10/31/2014	Carman, Tim; Judkis, Maura	WP
WP-shrimp03	A shrimper gets creative to survive	12/14/2011	Black, Jane	WP
WP-shrimp04	DeLauro's claim that the Trans Pacific free trade deal would spur a 'flood' of frozen	4/29/2015	Kessler, Glenn	WP

	shrimp; The Connecticut Democrat fails to mention that frozen shrimp already has no duties.			
WP-shrimp05	In Thai shrimp sheds, exploited labor	9/22/2012	Motlagh, Jason	WP
WP-shrimp06	A refuge in shrimping slips toward ruin; A long journey landed Vietnamese fishermen in the Gulf Coast. They rebuilt after Hurricane Katrina. They don't know if they can do it again.	6/27/2010	Mui, Ylan	WP
WP-shrimp09	Adrift in oil, then money	10/20/2010	Fahrenthold, David; Kindy, Kimberly	WP
WP-shrimp11	In Louisiana, there's still a catch of the day; Menus feature new species, but worries about spill remain	6/7/2010	Vargas, Theresa	WP
WP-shrimp13	As oil gushes, gulf oysters give way to fried calamari	7/11/2010	Burch, Audra	WP
WP-shrimp14	U.S. military seafood buys aid troubled gulf industry	2/7/2011	Foster, Mary	WP
WP-shrimp15	Fish imported to U.S. was often caught illegally, study finds	4/21/2014	Fears, Darryl	WP
LAT-seafood01	THE WORLD; Whales have high levels of toxins; Sperm whales have built up dangerous amounts of heavy metals. Threat seen to human food supply.	6/27/2010	Arthur, Max	LAT
LAT-seafood02	HOMETOWN, U.S.A.: Steinhatchee, Fla.; Scallops escape oil but not nets; Their season opens early to avoid fallout from the spill. Divers and diners rejoice.	6/27/2010	Spear, Kevin	LAT
LAT-seafood03	The oysters are their world, and it's in peril; The oil spill sets off a chain of events that affects a way of life in Louisiana and beyond.	7/18/2010	Huffstutter, P J; Nicole Santa Cruz; Powers, Ashley	LAT
LAT-seafood04	THE NATION; An ecosystem out of balance; A tactic to keep the gulf oil spill	8/3/2010	Nicole Santa Cruz; Huffstutter, P J	LAT

	at bay has altered salinity levels, putting species at risk.			
LAT-seafood06	There's little appetite for gulf seafood; In Louisiana, where fishing is a mainstay, even locals won't eat the catch.	8/27/2010	Murphy, Kim	LAT
LAT-seafood08	Gulf seafood is safe to eat, FDA says	10/30/2010	Huffstutter, P J	LAT
LAT-seafood09	Fishing for tourists on the Chesapeake; It's hard times for many oystermen and crabbers. Now they're learning a new skill.	12/3/2010	Wheeler, Timothy B	LAT
LAT-seafood10	Pacific study finds 9% of fish are tainted by plastic; Survey of lanternfish suggests marine debris could end up in the food chain.	7/2/2011	Barboza, Tony	LAT
LAT-seafood12	Seafood in L.A. often mislabeled; Tests at 74 restaurants and grocery stores show fish were often different species, a nonprofit group says.	4/17/2012	Carpenter, Susan	LAT
LAT-seafood13	Shellfish farm is a possible sea change; Long Beach man plans an underwater ranch with environmental and business upsides.	8/6/2012	Sahagun, Louis	LAT
LAT-seafood14	A sea change in ocean chemistry; Increased acidity from greenhouse gas poses risks to marine life and the seafood industry.	10/7/2012	Weiss, Kenneth R	LAT
LAT-seafood15	THE WORLD; Overfishing may end a way of life; Anchovy fishing is key to Peru as an export of fish meal and local food source, but the supply is rapidly dwindling.	2/10/2013	Briceno, Franklin; Bajak, Frank	LAT
LAT-seafood16	33% of seafood is mislabeled, 2-year DNA study finds	2/22/2013	Lopez, Ricardo	LAT
LAT-seafood17	FOOD &DINING; FARMERS MARKETS; Fresh angle on ocean's bounty; The fair-trade fishery	5/11/2013	Karp, David	LAT

	Community Seafood brings its ideals to Santa Monica.			
LAT-seafood18	Maine is ready to take lobster center stage; The state has plans to market its brand nationally and beyond and increase sales of the seafood.	9/15/2013	Canfield, Clarke	LAT
LAT-seafood19	How do you fight alien invaders? Eat 'em; Turning destructive marine life into tasty seafood helps trim the population, but it's 'not a silver bullet.'	6/1/2014	Plushnick-Masti, Ramit	LAT
LAT-seafood21	Congress urged to ban Russian seafood imports	8/7/2014	LeVine, Marianne	LAT
LAT-seafood22	L.A. seafood firm is ordered to close	12/5/2014	Pierson, David	LAT
LAT-seafood23	THE NATION; Pristine and protected; Obama declares southwestern Alaska's Bristol Bay and its lucrative salmon fishery indefinitely off-limits to oil and gas development	12/17/2014	La Ganga, Maria L	LAT
LAT-seafood25	Pirates, slavery plague Thailand's seafood industry; The vast enterprise is almost wholly dependent on cheap migrant labor.	3/1/2015	McDowell, Robin; Mason, Margie	LAT
LAT-seafood26	THE WORLD; Seafood slaves finally free; Almost 600 are heading home after being held captive on fishing boats in Indonesia.	5/17/2015	Mason, Margie	LAT
LAT-seafood27	THE NATION; Crazy demand for geoduck; The odd-looking clam has become a delicacy at home and in China.	5/17/2015	Le, Phuong	LAT
NYT-seafood01	As Oil and Fear Spread, Gulf Fishing Rules Tighten	7/14/2010	Severson, Kim	NYT
NYT-seafood02	Can Seafood Be Kosher and Sustainable?	12/14/2014	Greenberg, Paul	NYT
NYT-seafood06	Study Finds Seafood Is Often Mislabeled in New York	12/11/2012	Moskin, Julia	NYT
NYT-seafood07	Outbreak of Rare Infection Is Linked to Chinese Seafood Markets	3/6/2014	Santora, Marc	NYT

NYT-seafood08	U.S. Announces Plan to Combat Illegal Fishing	3/17/2015	Nixon, Ron	NYT
NYT-seafood09	Wal-Mart Suspends Supplier Of Seafood	6/30/2012	Greenhouse, Steven	NYT
NYT-seafood10	A Ban on Some Seafood Has Fishermen Fuming	4/22/2012	Goodnough, Abby	NYT
NYT-seafood11	Health Officials Call for More Fish in Diets of Children and Pregnant Women	6/11/2014	O'Connor, Anahad	NYT
NYT-seafood13	Aquarium's App Suggests Sustainable Seafood Items	4/3/2011	Mohn, Tany	NYT
NYT-seafood14	American Catfish Industry Could Suffer Under the Stricter Standards It Sought Out	3/21/2015	Nixon, Ron	NYT
NYT-seafood15	Where Fishermen See Stars	6/24/2012	Bigar, Sylvie	NYT
NYT-seafood16	Tests Say Mislabeled Fish Is a Widespread Problem	12/11/2012	Rosenthal, Elisabeth	NYT
NYT-seafood17	A New App for Sushi Lovers	12/13/2011	Barringer, Felicity	NYT
NYT-seafood19	Picking Apart Objections to Eating Fish	8/18/2014	Brody, Jane	NYT
NYT-seafood20	U.S. Catfish Program Could Stymie Pacific Trade Pact, 10 Nations Say	6/28/2014	Nixon, Ron	NYT
NYT-seafood24	Fish Prices and the Environmental Debate	6/22/2011	Rich, Motoko	NYT
NYT-seafood25	Fukushima Radiation (Still) Poses No California Risk	1/15/2014	Revkin, Andrew	NYT
NYT-seafood28	Fishing More, Catching Less	3/27/2014	Pauly, Daniel	NYT
NYT-seafood29	Obama Plans Protected Marine Area in Pacific Ocean	6/18/2014	Davenport, Coral	NYT
NYT-seafood30	Fears Accompany Fishermen In Japanese Disaster Region	6/26/2012	Tabuchi, Hiroko	NYT
USA-seafood05	Spill takes bite out of seafood restaurants; Shrinking supply, rising costs have establishments retooling menus	6/24/2010	Leinwand, Donna	USA
USA-seafood06	Gulf seafood still a concern for shoppers; Experts say it's safe, but consumers remain wary	5/24/2011	Brophy Marcus, Mary	USA

USA-seafood07	EPA fines seafood processor millions	9/29/2011	Weise, Elizabeth	USA
USA-seafood08	Fishy fakes common in stores, restaurants; Study: High-priced seafood often not what you think	2/21/2013	Weise, Elizabeth	USA
USA-seafood10	Marriott institutes sustainable seafood program; 'Future Fish' to direct purchases by chefs	12/23/2010	De Lollis, Barbara	USA
USA-seafood11	Nothing fishy about seafood; Healthful meals can be quick and simple	12/14/2011	Kreiger, Ellie	USA
USA-seafood12	Group wants government to buy Gulf Coast seafood	12/9/2010	Fritze, John	USA
USA-seafood13	Consumers get fished in; 22% of seafood has label problems, magazine says	10/28/2011	Horovitz, Bruce	USA
USA-seafood18	Safeway scales the 'seafood scorecard' by Greenpeace; Chain tops list based on buying practices	4/18/2011	O'Donnel, Kim	USA
USA-seafood19	Seafood diet may keep vision loss at bay; Omega-3s might stall macular degeneration	12/2/2010	Brophy Marcus, Mary	USA
USA-seafood22	Disasters hit Texas oyster crop; Spread of algae bloom threatens consumer health and industry	12/14/2011	Jervis, Rick	USA
WP-seafood02	Presidential panel proposes steps to curtail black-market fishing, false seafood labels	12/16/2014	Eilperin, Juliet	WP
WP-seafood06	Green' seafood labels are under fire	4/23/2012	Eilperin, Juliet	WP
WP-seafood08	Dispersants not hurting seafood, FDA says; No significant retention of substance found in fish, agency reports	8/7/2010	Layton, Lyndsey	WP
WP-seafood10	Eating sustainably: Making smart choices about which types of fish to choose and which to avoid	6/25/2013	Palmer, Brian	WP

WP-seafood11	Climate change is really bad news if you like oysters, scallops and clams	2/24/2015	Kollipara, Puneet	WP
WP-seafood12	Seafood with a side of dread; Oil hasn't hit South Atlantic, but spill's effects reverberate through industries	7/10/2010	Shapira, Ian	WP
WP-seafood13	Supply of places to fish is dwindling	12/3/2010	Eilperin, Juliet	WP
WP-seafood14	Latest wave of trouble puts Mississippi oyster season in doubt	7/17/2011	Weber, Harry	WP
WP-seafood15	When red snapper is a fish of a different color	2/21/2013	Eilperin, Juliet and Carman, Tim	WP
WP-seafood16	For shuckers, the world is no longer their oysters; As oil spill reduces imports, Chesapeake work has run dry	7/2/2010	Fahrenthold, David	WP
WSJ-seafood01	U.S. Adds Measures to Check Gulf Seafood	6/14/2010	Solsman, Joan	WSJ
WSJ-seafood05	Corporate News: Restaurants Mobilize to Save Fisheries --- As Global Consumption Soars, Big Buyers Join Growing Effort Toward Eco-Friendly Practices Meant to Sustain Species	7/12/2010	Ziobro, Paul	WSJ
WSJ-seafood07	Thai Union Frozen To Buy MW Brands for $883 million		Murray, Leigh and Setthasiriphaiboon, Piyarat	WSJ
WSJ-seafood08	Schooling Fish Customers; Government Declares Gulf Seafood Safe, Consumers Divided	8/24/2010	Associated Press	WSJ
WSJ-seafood09	The New School; Adventurous chefs are introducing some unlikely fish in the name of 'sustainable seafood.' Will the public bite?	10/22/2010	Garbarino, Steve	WSJ
WSJ-seafood10	U.S. News: Standards for Gulf's Catch Put to Sniff Test After Spill	11/2/2010	Ball, Jeffrey	WSJ
WSJ-seafood11	Oysters Lose Their Allure; Industry Fears the Public Will Shun the Mollusks in the Wake of the BP Spill	11/5/2010	Ball, Jeffrey	WSJ

WSJ-seafood13	Lobsters Caught in China Smuggling Crackdown	11/30/2010	Brindal, Ray	WSJ
WSJ-seafood15	Thousands of Islands, Many Fish --- Indonesia Modernizes Its Infrastructure as Part of an Effort to Dominate the Global Seafood Market	4/11/2011	Bellman, Eric	WSJ
WSJ-seafood16	Report Faults FDA Over Risks From Imported Seafood	5/16/2011	Tomson, Bill	WSJ
WSJ-seafood17	U.S. News: Scallops Ride to Rescue --- Demand, Rising Prices Keep Former Whaling Port in Massachusetts Above Water	6/20/2011	Levitz, Jennifer	WSJ
WSJ-seafood19	U.S. News: Toll on Shellfish Takes a While To Become Clear	4/13/2012	Fowler, Tom	WSJ
WSJ-seafood20	FDA Warns Against Korean Seafood	6/15/2012	Tomson, Bill and In-Soo, Nam	WSJ
WSJ-seafood21	The Catfish Solution; U.S. Senators drop seafood protectionism against Vietnam.	6/21/2012	Anonymous	WSJ
WSJ-seafood22	U.S. News: Season Delay Riles Crabbers --- Oregon Crews and Vendors Chafe as Rules Postpone Lucrative Crustacean Harvest	12/29/2012	Millman, Joel	WSJ
WSJ-seafood24	Waste, Fraud and Fish; How catfish protectionists cost taxpayers money.	3/21/2013	Anonymous	WSJ
WSJ-seafood25	U.S. News: Poaching Pinches Alaskan Crabbers	4/4/2013	Carlton, Jim	WSJ
WSJ-seafood27	Fish Is Off the Menu in South Korea Over Radiation Fears; Koreans Avoid Seafood Over Fears of Fukushima Contamination	11/14/2013	Kwanwoo, Jun	WSJ
WSJ-seafood28	BP Seeks to Halt Seafood-Industry Fund Payments; Oil Company Claims Deck Hands Submitted False Claims	12/17/2013	Fowler, Tom	WSJ
WSJ-seafood29	Marine Harvest Seeks to Garner Interest From U.S.	1/27/2014	Hovland, Kjetil Malkenes	WSJ

	Investors; Company Seeking Organic Growth Together With Mergers, Acquisitions			
WSJ-seafood30	Now Packed With Drama: Cans of Tuna Fish --- StarKist, Bumble Bee and Chicken of the Sea Fight to Be American Enough for Uncle Sam's Blessing	2/18/2014	Hagerty, James	WSJ
WSJ-seafood31	Why People Are Eating Less Fish; As Consumption of Seafood Declines, Part of Problem Is Fragmented Industry	4/15/2014	DiPietro, Ben	WSJ
WSJ-seafood33	FDA to Increase Calls for More Fish Consumption; Pregnant women and nursing mothers are encouraged to have more seafood in diets	6/16/2014	Rochman, Bonnie	WSJ
WSJ-seafood35	Calif. Bill Would Mandate New Seafood Names	9/24/2014	DiPietro, Ben	WSJ
WSJ-seafood38	U.S. Catfish Fight Expected to Sink a Popular Import; USDA to tighten rules for Vietnamese fish known as basa or swai	3/23/2015	Tracy, Tennille	WSJ
WSJ-seafood39	Business News: Startups Upend Japan's Seafood Business	5/16/2015	Warnock, Eleanor	WSJ
LAT-fisheries01	Fishing nets, not oil, may be culprit in sea turtle deaths; Many of the animals found dead on gulf beaches appear to have drowned.	6/26/2010	Murphy, Kim	LAT
LAT-fisheries02	Obama to reset policy on oceans; The plan embraces a controversial zoning practice that could confine conservation, drilling and fishing.	7/19/2010	Tankersley, Jim	LAT
LAT-fisheries03	Fishing limits urged for Alaska	8/3/2010	Murphy, Kim	LAT
LAT-fisheries04	CALIFORNIA; Wild steelhead retain federal protections	8/23/2010	Williams, Carol J	LAT
LAT-fisheries05	Killing of sea lions to save salmon halted; A federal	11/24/2010	Williams, Carol J	LAT

	court panel notes that fishing for the Columbia River stock is allowed.			
LAT-fisheries06	CRISIS IN JAPAN; Japan's fishermen fear toxic legacy; Those who rely on the sea say radiation concerns may destroy their livelihoods.	3/24/2011	Glionna, John M; Hall, Kenji	LAT
LAT-fisheries09	Power plant intakes killing millions of Great Lakes fish; Industry has resisted alternative cooling equipment that would protect prized species.	7/22/2011	Hawthorne, Michael	LAT
LAT-fisheries10	Crabbers are fishing for a brighter future; Maryland watermen have been meeting to map out a more sustainable livelihood.	8/19/2011	Wheeler, Timothy B	LAT
LAT-fisheries14	Let 'forage fish' multiply, scientists say; Seemingly abundant, they are caught in large quantities and can be overfished, a panel warns.	4/2/2012	Barboza, Tony	LAT
LAT-fisheries16	CALIFORNIA; White abalone on brink of going extinct; Researchers say the only way to save the shellfish is through human intervention.	7/5/2012	Barboza, Tony	LAT
LAT-fisheries17	Northwest fish are back in the water; Wild trout are a sign of success for a massive river restoration project.	7/15/2012	Murphy, Kim	LAT
LAT-fisheries18	Midwest heat wave killing thousands of fish; High temperatures combine with lower water levels to cause die-offs in Minnesota, the Dakotas and Wisconsin.	7/15/2012	Karnowski, Steve	LAT
LAT-fisheries20	Shark population on decline in Persian Gulf; Practice of hacking the fins off sharks thrives in the region and laws are weak.	10/28/2012	Casey, Michael	LAT
LAT-fisheries21	Ocean reserve gets last piece; In the works since '99, it's the	12/19/2012	Weiss, Kenneth R	LAT

	largest network of marine parks in the continental U.S.			
LAT-fisheries23	To save a fish, poison put in creek; Pea-derived rotenone kills nonnative trout species that had squeezed out rare Paiute cutthroat trout.	9/3/2013	Sahagun, Louis	LAT
LAT-fisheries25	Crabbers are feeling pinched by shutdown; Fishermen can't get permits for king crab season. Farmers and physicists are also hit.	10/12/2013	Simon, Richard	LAT
LAT-fisheries26	THE NATION; The slippery world of eelers; While others chase oysters, an eel fisherman makes a go of it in Maryland waters. The creatures seem to abound, but profiting from them can by tricky.	11/24/2013	Wheeler, Timothy B	LAT
LAT-fisheries27	In Texas, giving oysters room to build	11/24/2013	Plushnick-Masti, Ramit	LAT
LAT-fisheries29	Sardine crash raising alarms; Experts warn of peril if populations of the oily fish don't recover soon	1/6/2014	Barboza, Tony	LAT
LAT-fisheries31	Fish out of water; California's drought has hindered the migratory journeys of many coho salmon, putting them in immediate danger	2/10/2014	Barboza, Tony	LAT
LAT-fisheries32	U.S. calls for limits on fishing in Arctic Ocean	2/23/2014	La Ganga, Maria L	LAT
LAT-fisheries34	THE WORLD; Japanese losing their taste for whale; The market for the meat is shrinking and the subsidized hunting program is losing money.	3/30/2014	Yamaguchi, Mari	LAT
LAT-fisheries35	Scientists want to breed fish to be better biters	5/4/2014	Barnard, Jeff	LAT
LAT-fisheries36	Groups say federal plan for salmon falls short; A lawsuit asks a judge to make agencies craft a strategy that will better protect the fish.	6/18/2014	La Ganga, Maria L	LAT

LAT-fisheries38	Cape Cod losing its namesake fish; Local commercial fishermen attempt to stay afloat by netting lesser-known species.	8/31/2014	Semuels, Alana	LAT
NYT-fisheries01	2 Fisheries Collapsed Unnoticed, Study Says	10/25/2011	Garthwaite, Josie	NYT
NYT-fisheries03	Certification of Krill Harvest Upsets Conservationists	6/23/2010	Jolly, David	NYT
NYT-fisheries04	An Ecolabel for McDonald's Fish Fare	1/27/2013	Jolly, David	NYT
NYT-fisheries05	Europe Adopts Sweeping Changes to Fishing Policy	2/7/2013	Jolly, David	NYT
NYT-fisheries06	Bracing for a New England Trawling Decision	2/14/2013	Bryce, Emma	NYT
NYT-fisheries08	4,600 Sea Turtles Killed Yearly by Fishing, Study Suggests	9/14/2011	Kaufman, Leslie	NYT
NYT-fisheries09	The Sturgeon's Looming Endangered Listing	2/28/2012	Weisberg, Deborah	NYT
NYT-fisheries11	As Regulators Meet, Fishing Boats Thumb Their Noses	6/4/2012	Jolly, David	NYT
NYT-fisheries12	Scientists Say Cod Are Scant; Nets Say Otherwise	12/11/2011	Goodnough, Abby	NYT
NYT-fisheries13	Keep the Fishing Ban in New England	1/31/2013	Roberts, Callum	NYT
NYT-fisheries14	Battle Brews Over a Small, Vital Fish	12/13/2012	Bryce, Emma	NYT
NYT-fisheries15	Broad Catch Limits Are Put on Menhaden, an Unglamorous but Essential Fish	12/15/2012	Bidgood, Jess	NYT
NYT-fisheries16	A Small Victory for Whale Sharks	12/6/2012	Jolly, David	NYT
NYT-fisheries17	Let Us Eat Fish	4/15/2011	Hilborn, Ray	NYT
NYT-fisheries18	Proposal for Europe's Fisheries Draws Fire	7/14/2011	Jolly, David	NYT
NYT-fisheries20	Smelt Have Seen the Light	4/14/2015	Chen, Ingfei	NYT
NYT-fisheries23	European Officials Move To Curb Overfishing	5/31/2013	Jolly, David	NYT
NYT-fisheries24	Facing Europe Subsidy Vote, Anglers Cling to Old Ways	10/24/2013	Jolly, David	NYT
NYT-fisheries25	Smarting Over Cod Shortages, Fishermen Blame Seals	2/3/2012	Jolly, David	NYT

NYT-fisheries28	Fishing More, Catching Less	3/27/2014	Pauly, Daniel	NYT
NYT-fisheries29	Eat Your Hake and Have It, Too	5/24/2012	Hilborn, Ray and Holborn, Ulrike	NYT
NYT-fisheries30	U.S. Declares A Disaster For Fishery In Northeast	9/14/2012	Bidgood, Jess and Johnson, Kirk	NYT
NYT-fisheries31	As Fisheries Struggle, Debate Heats Up Over How to Help	2/16/2013	Bidgood, Jess	NYT
NYT-fisheries32	Europe Rejects New Fishing Subsidies	10/24/2013	Jolly, David	NYT
NYT-fisheries33	On Subsidies, Fish and Fishing	10/6/2011	Revkin, Andrew	NYT
NYT-fisheries34	For Small Fishermen, a Fairness Issue	11/30/2011	Kaufman, Leslie	NYT
NYT-fisheries35	Import Ban Sought on Asian Crabs	2/26/2013	Hurdle, Jon	NYT
NYT-fisheries36	Where Have All the Cod Gone?	1/7/2015	Bolster, W. Jeffrey	NYT
NYT-fisheries38	Environmental Partnership Keeps Both Fish Stocks and Livelihoods in Mind	11/28/2011	Kaufman, Leslie	NYT
NYT-fisheries39	Daunting Calculus for Maine Shrimpers as Entire Season Is Lost	12/1/2014	Bidgood, Jess	NYT
NYT-fisheries40	Team Tracks a Food Supply at the End of the World	3/13/2012	Moran, Susan	NYT
NYT-fisheries41	Too Many Small Fish Are Caught, Report Says	4/2/2012	Fountain, Henry	NYT
NYT-fisheries42	Odd Alliance Is Forged Over Access To Herring	7/4/2012	Bidgood, Jess	NYT
NYT-fisheries43	The Shocking News About Cod	10/1/2012	Anonymous	NYT
NYT-fisheries44	E.U. Faces Dispute Over Mackerel Quotas	1/29/2013	Jolly, David	NYT
NYT-fisheries45	Officials Back Deep Cuts in Atlantic Cod Harvest to Save Industry	1/31/2013	Seelye,Katharine; Bidgood, Jess	NYT
NYT-fisheries46	Massachusetts: Fishery Group Limits Herring Catch	9/27/2013	Bidgood, Jess	NYT
NYT-fisheries49	Ancient Hawaiians Caught More By Fishing Less	3/25/2012	Main, Douglas	NYT
NYT-fisheries50	A Rebound for 6 Fish Populations	5/14/2012	Kaufman, Leslie	NYT
NYT-fisheries51	Saving Striped Bass	5/11/2014	Crocker, Michael	NYT
NYT-fisheries53	A Milestone in Fisheries Management	1/20/2012	Anonymous	NYT

NYT-fisheries54	Fishermen in Brazil Save a River Goliath, and Their Livelihoods	11/13/2014	Romero, Simon	NYT
NYT-fisheries55	Waters Warm, and Cod Catch Ebbs in Maine	12/15/2014	Wines, Michael and Bidgood, Jess	NYT
NYT-fisheries58	Experts Debate Limits of Fish Farming	2/1/2011	Jolly, David	NYT
NYT-fisheries59	U.S. Proposes Aquaculture Guidelines	2/10/2011	Dean, Cornelia	NYT
NYT-fisheries62	U.S. Reopens Waters Off New England For Fishing	12/21/2012	Bidgood, Jess	NYT
NYT-fisheries63	Accord Would Regulate Fishing in Arctic Waters	4/17/2013	Kramer, Andrew	NYT
USA-fisheries01	Shortnose sturgeon standoff; Protecting fish could cost S.C. utility millions	11/19/2010	Barnett, Ron	USA
USA-fisheries02	Throwing at-risk Pilgrim-era fish a line; Catch limits could put tons more in water	11/29/2011	Weise, Elizabeth	USA
USA-fisheries03	Fish hook good news as stocks rebound	3/14/2013	Koch, Wendy	USA
USA-fisheries04	Federal catch limits create fishing crisis	1/13/2014	The Associated Press	USA
USA-fisheries05	Japan plant pumps radioactive water into ocean; Conservation groups worry about effects it will have on fisheries	4/5/2011	Dorell, Oren	USA
USA-fisheries06	The lure for catfish farmers is sinking; Industry buckles under an increase in feed costs and as cheaper imported fish flood the market	10/20/2010	Roney, Marty	USA
USA-fisheries15	Program takes bull's-eye off sharks; Marinas urged to stop showboating, recreational killing of threatened fish	10/18/2011	Lollar, Kevin and Ruane, Laura	USA
USA-fisheries17	And now, the spill's cost comes into focus; As well is capped, the mark on the Gulf region will endure	8/5/2010	Jervis, Rick	USA
USA-fisheries20	Oil spill disrupts seafood industry along Gulf Coast;	10/8/2010	Jervis, Rick	USA

	Falling supply, demand hurt businesses			
USA-fisheries21	High-tech gear helps reel in fish poachers; GPS, virtual fences can combat a rising tide of illegal activity	3/7/2011	Latshaw, Greg	USA
WP-fisheries01	Fisheries declining but restorable, study finds	9/28/2012	Eilperin, Juliet	WP
WP-fisheries03	To tackle overfishing, conservation groups look to the past	3/4/2014	Bernstein, Lenny	WP
WP-fisheries04	The shad are running low	6/17/2013	Fears, Darryl	WP
WP-fisheries07	An unprecedented move to preserve U.S. fisheries			WP
WP-fisheries10	Saving the world's fisheries	10/4/2012	Editorial Board	WP
WP-fisheries11	NOAA to impose new shark-fishing limits	11/17/2012	Eilperin, Juliet	WP
WP-fisheries13	White House issues new rules for fish farms in federal waters	7/13/2011	Eilperin, Juliet	WP
WP-fisheries14	As 'most important fish' declines, experts debate course	8/1/2011	Fears, Darryl	WP
WP-fisheries15	Fisheries panel approves cut in menhaden harvest	11/10/2011	Fears, Darryl	WP
WP-fisheries16	Winter blamed for plunge in bay's blue crab population	5/2/2014	Fears, Darryl	WP
WP-fisheries18	Little fish are most valuable when left in the sea, panel says	4/2/2012	Eilperin, Juliet	WP
WP-fisheries19	Despite gains, U.S. fisheries facing challenges	5/5/2013	Bernstein, Lenny	WP
WP-fisheries21	In Hawaii, bycatch limits loosened	10/7/2012	Fears, Darryl	WP
WP-fisheries22	World's fish on move to cooler waters, study finds	5/16/2013	Bernstein, Lenny	WP
WP-fisheries23	Crab conservation plan appears to be working	10/6/2011	Mitrano, Erica	WP
WP-fisheries24	International negotiators rule on measures to protect sharks	11/20/2011	Eilperin, Juliet	WP
WP-fisheries26	Senate passes bill to protect Pacific sharks from fin trade	12/21/2010	Eilperin, Juliet	WP
WP-fisheries27	House follows Senate on shark protection	12/22/2010	Eilperin, Juliet	WP

WP-fisheries28	Controversy over rockfish quotas	12/31/2013	Wheeler, Timothy B	WP
WP-fisheries33	Scientists call for end to deep-sea fishing	9/7/2011	Eilperin, Juliet	WP
WP-fisheries37	Kerry: Gathering will seek global action to protect oceans	7/12/2014	Eilperin, Juliet	WP
WP-fisheries39	Fishing groups criticize Obama's Pacific plan	7/2/2014	Eilperin, Juliet	WP
WP-fisheries41	Presidential panel looks to curtail 'pirate fishing'	12/17/2014	Eilperin, Juliet	WP
WP-fisheries42	Shell shock: Your crab may be an out-of-town impostor	4/1/2015	Carman, Tim	WP
WP-fisheries43	Eat it till it's gone; Environmentalists push for edible eradication of the invasive lionfish	7/7/2010	Eilperin, Juliet	WP
WP-fisheries44	Bay oyster population in recovery	3/5/2012	Fears, Darryl	WP
WP-fisheries45	First limit is placed on Atlantic menhaden catch	12/15/2012	Fears, Darryl	WP
WP-fisheries49	Common ground on GMOs may be in oceans	7/23/2013	Haspel, Tamar	WP
WP-fisheries51	S. Korea bans import of fish from coast near Japan's stricken nuclear plant	9/7/2013	Harlan, Chico	WP
WP-fisheries52	Distaste widening for shark's fin soup	6/6/2011	Eilperin, Juliet	WP
WP-fisheries54	Researchers propose putting a price on the killing of whales	1/13/2012	Eilperin, Juliet	WP
WP-fisheries56	Lured by the promise of a big catch	3/19/2011	Sieff, Kevin	WP
WP-fisheries57	Fisheries at risk as oceans acidify	7/31/2014	Wilson, Reid	WP
WP-fisheries59	National ocean policy faces rising partisan tide	10/29/2012	Eilperin, Juliet	WP
WP-fisheries60	New England cod fishing sharply limited	1/31/2013	Associated Press	WP
WP-fisheries62	The Gulf of Alaska is unusually warm, and weird fish are showing up	2/10/2015	Izadi, Elahe	WP
WSJ-fisheries01	U.S. News: New Plan To Assist Fishermen	7/12/2010	Hudson, Kris	WSJ
WSJ-fisheries02	Corporate News: Restaurants Mobilize to Save Fisheries --- As Global Consumption	7/12/2010	Ziobro, Paul	WSJ

	Soars, Big Buyers Join Growing Effort Toward Eco-Friendly Practices Meant to Sustain Species			
WSJ-fisheries03	The Gulf Oil Spill: Early Look at Ecological Toll Is Alarming, Scientists Say	7/19/2010	Ball, Jeffrey	WSJ
WSJ-fisheries04	Gone Fishing: Louisiana Shrimpers Get Back to Work	8/16/2010	Esterl, Mike	WSJ
WSJ-fisheries05	Much Oil Remains in Gulf, Researchers Estimate	8/17/2010	Hotz, Robert Lee	WSJ
WSJ-fisheries07	A Fish's Tale: Depletion, Quotas and Discarding	12/3/2010	Palling, Bruce	WSJ
WSJ-fisheries09	Skippers at Sea Over a License to Fish; Federal Officials Curb Permits to Alaska's Chartered Halibut Fleet to Stop Overfishing, but Some Boat Operators Fear Ruin	1/15/2011	Carlton, Jim	WSJ
WSJ-fisheries11	Disaster in Japan: Impact on Marine Life Is Expected to Be Minimal	3/19/2011	Hotz, Robert Lee and Wang, Shirley	WSJ
WSJ-fisheries13	U.S. News: Oystermen Scrape Bottom --- Mississippi Flooding Threatens Louisiana Industry Reeling From 2010 Oil Spill	5/19/2011	Esterl, Mike	WSJ
WSJ-fisheries17	World News: Fishermen Reel Under Quotas	8/10/2012	Levitz, Jennifer	WSJ
WSJ-fisheries18	China's Hunger for Fish Upsets Seas; Reach of Massive Fleet Cuts Into Stock, Tests Ties on Opposite Side of the World	12/28/2012	Chuin-Wei Yap; Mohindru, Sameer	WSJ
WSJ-fisheries19	Cod Shortage Roils Northeast; Ecological, Economic Interests at Odds as Tight Quota Threatens Fishing Industry	1/30/2013	Levitz, Jennifer	WSJ
WSJ-fisheries20	Nuclear Plant Report Evaluates Fish Impact	2/6/2013	Anonymous	WSJ
WSJ-fisheries23	Europe Haggles Over New Rules Aimed at Saving Fish Stocks; A Ban on Discarding Unwanted Fish Overboard	8/27/2013	Dalton, Ashley	WSJ

	Raises Questions of Cost and Enforceability			
WSJ-fisheries24	U.S. News: Giant Clams Spark Trade Spat --- China Says the Delicacy Called Geoducks Are Tainted; U.S. Disagrees With Ban	12/30/2012	Newman, Jesse	WSJ
WSJ-fisheries26	Catchy Idea: To Battle Asian Carp, Send Them to Asia --- Entrepreneurs Search for Marketing Hooks For Invasive Species; 'Kentucky White Fish'	1/30/2014	Campo-Flores, Arian	WSJ
WSJ-fisheries27	Illegal Trading Of Young Eels Is Investigated; Amid High Demand in Asia, Officials Examine Possible Export-Law Violations	5/6/2014	Calvert, Scott	WSJ
WSJ-fisheries29	EU Threat Looms Over Philippine Fishing Industry; EU Demands Philippines Improve Monitoring, Control and Surveillance Capabilities	6/20/2014	Moss, Trefor	WSJ
WSJ-fisheries30	Japan, South Korea Ban Each Other's Fishing Boats; Boats Denied Access to Exclusive Zones for First Time Since 1999	7/4/2014	Sekiguchi, Toko; Kwanwoo Jun	WSJ
WSJ-fisheries33	U.S. Catfish Fight Expected to Sink a Popular Import; USDA to tighten rules for Vietnamese fish known as basa or swai	3/24/2015	Tracy, Tennille	WSJ
WSJ-fisheries34	EU Puts Thailand On the Hook Over Illegal Fishing; Thailand to face a ban in six months if it doesn't clean up its fishy act	4/21/2015	Moss, Trefor	WSJ