InFishWeTrust.com: Localizing Sustainability

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Preface

One day I hope to change how we manage our ocean resources. In particular, I am interested in issues surrounding the fishing industry and the global trade of seafood. Increasing demands for seafood and the rapid depletion of our living marine resources have created a dynamic set of issues regarding the future health of our world’s oceans. Symptoms of today’s seafood markets not only affect our marine ecosystems, but also have the potential to disrupt our social and economic systems. As such, I am dedicated towards promoting sustainable seafood initiatives where policy, communications and science work in concert.

In general, this project aims to support sustainable seafood initiatives using a ‘bottom-up’ (demand) approach. My primary objectives are to increase exposure of sustainable seafood markets and programs and promote consumer acceptance for sustainable seafood without neglecting the needs and wants of San Diego County citizens. To accomplish these objectives, the following projects were developed. First, a San Diego County-wide survey was conducted to gather data on consumer eating and purchasing behavior with regards to seafood. Second, information gathered from scientific literature, social marketing campaigns and data extracted from the surveys were used to create InFishWeTrust.com, a website promoting sustainable seafood initiatives in San Diego. The website provides the following information for consumers:
(1) Where, what and how to buy sustainable seafood. (2) Information on commercially valuable marine species and their sustainability. (3) Access to a network of established seafood programs and (5) tools to promote local and nationwide engagement.

**Background/Problem Statement**

The increasing demand for seafood and the rapid depletion of our living marine resources have created a dynamic set of issues regarding the future viability of our world's oceans and food security. Today, Americans consume over 2.5 tons of seafood a year, which makes the U.S. the third largest consumer of seafood in the world, behind China and Japan (Voorhess and Pritchard, 2008). Demand for seafood products has doubled in the last 30 years (Delgado et al., 1998) and models analyzing income and demographic effects predict the U.S. per capita consumption of fish, which currently hovers around 16.3 pounds (Voorhess and Pritchard, 2008), will increase up to 6.5 percent by the year 2020 (USDA, 1998). The largest factor, however, is overall U.S. population growth, which is expected to rise by more than 50 million people between the years 2000 to 2020 (Blisard, 2002). A USDA survey estimates the aggregate affects of expected population growth and growth in per capita fish consumption will increase U.S. demand for seafood by 25.71 percent within the same time period (USDA, 1998). Worldwide, the demand for seafood follows a similar trend (Blisard, 2002), with a 30 percent increase in demand by the year 2030, an amount equivalent to 40 million additional tons of seafood (FAO, 2006).

Can today's current supply meet tomorrow's growing demand? Reports show that over 75 percent of today's commercially valuable fish stocks are fully exploited, overexploited or depleted (FAO, 2006). A study by Worm et al. (2006) predicts that continuing present day fishing practices may result in the 'collapse' of much of the world's commercial fish stocks by the year 2048. A majority of current commercial fisheries are fully exploited, reducing their capacity to expand and fill the growing gap between today's supply and tomorrow's demand (Pauly et al., 2002). As a result, aquaculture has become a popular solution to satisfy future seafood needs (Seafood Choices Alliance, 2008). Aquaculture has boomed over the last 30 years and has become that fastest growing food production sector in the world. With over 45 million tons of fish and shellfish produced annually, aquaculture provides the world's population with over half
of its seafood (FAO, 2006). Nevertheless, current aquaculture practices are highly intensive and a number of constraints put in question the sustainability and future growth of aquaculture (Pauly et al., 2002; Aburto-Oropeza et al., 2008).

Many aquaculture practices (e.g., salmon and shrimp farms) have a large ecological footprint (Rees, 1992) that depletes natural resources, damages and/or alters marine environments and reduces native marine populations at an absorbent rate. Folke et al., (1998) show that aquaculture farms require an enormous amount of additional marine resources for food production and the processing of aquacultural waste. Due to highly intensive aquaculture practices, many farms are susceptible to pollution and are breeding grounds for diseases and parasites, which are then transferred to surrounding ecosystems. For example, the impacts of salmon aquaculture on wild salmon and trout populations have reduced their survival rates and abundances by more than 50 percent in many cases (Ford and Myers, 2008).

The overexploitation of the world’s fisheries and destruction of marine habitats has changed how the ocean looks and operates. Since 1950, when industrial fishing began, 90 percent of large predatory fish populations (e.g., tuna, swordfish, cod, shark, etc.) have disappeared (Pauly et al., 1998). Meanwhile, between 8-20 million tons of fish (not including marine mammals, turtles or birds) are caught annually and discarded as bycatch (Zeller and Pauly, 2005). As top predators are extracted and other commercial and noncommercial species are overexploited, marine ecosystems loose the community structures that keep them healthy. Changes in marine food webs (simplification) reduce the ocean’s productivity (Folke et al., 1998), further enhancing its vulnerability to overfishing and making recovery from fishery-induced effects more difficult (Costello et al., 2008; Pauly et al., 2002).

Many societies are dependent on marine ecosystems for a number of goods and services that drive their economies. Fisheries-induced changes on the structure and functionality of marine ecosystems have the potential to threaten the livelihoods of those who are dependent on them. Close to one billion individuals rely on fish as their primary source of animal protein (Kura et al., 2004) and roughly 38 to 162 million people are dependent on fisheries and fishery related activities as their main source of income (Pauly et al., 2005). Furthermore, fisheries are a
valuable commodity in the global market, generating over 71.5 (US) billion dollars in international trade annually (FAO, 2006).

Despite troubling reports, most seafood consumers are unaware of the widespread mismanagement of fisheries and the depletion of many fish stocks around the world (Kemmerly and Macfarlane, 2008; Roper Starch Worldwide, 1999). Markets further exacerbate this problem through reduced transparency and the mislabeling of seafood products they sell, maintaining a rapport with consumers that current supply can keep up with markets demands (Jacquet and Pauly, 2008). In response, non-government organizations (NGOs) have launched a number of social marketing campaigns to increase awareness of the detrimental affects that fisheries and seafood markets have on marine ecosystems. With the use of market-based incentives, some campaigns aim to shift market demands away from unsustainable sources of seafood in hopes of improving ocean health (Kemmerly and Macfarlane, 2008). These range from certification and labeling of sustainable products and distribution of seafood pocket guides to candid boycotts of specific seafood.

Consumers hold an immense amount of control over the free market through their purchasing power and their decisions can be instrumental in forcing policy and market changes. For example, Americans love canned tuna, making it the second most consumed seafood product in the nation (3.9 pounds, per capita consumption) (Voorhess and Pritchard, 2008). Nevertheless, in the 1980's, following a media portrayal of dolphin killing aboard large tuna ships, coupled with scientific studies, that linked tuna fishing to more than 100,000 dolphins deaths per year (Teisl, Roe and Hicks, 2002), the public first learned yellowfin tuna harvests in the Eastern Tropical Pacific was directly responsible for the decline in Pacific dolphin populations. Public uproar would soon result in widespread consumer boycotts and the decreased demand for canned tuna. With quick legislative action and consumer pressure on the tuna market, the three largest U.S. tuna cannery companies banned together to develop new policy measures to assure canned tuna would no longer be responsible for the death of dolphins. Fishing methods were quickly modified to reduce dolphin mortality and in 1990, the dolphin-safe label was implemented and placed on all canned tuna products that complied with new harvesting standards (Teisl, Roe and Hicks, 2002).
There is a great potential for social marketing campaigns to have an impact on consumer decision making to benefit specific initiatives. Unfortunately, with regards to sustainable seafood, there are a number of barriers that exist that limit their success. Limited consumer knowledge and appreciation for environmental issues (Kemmerly and Macfarlane, 2008), a lack of transparency and labeling within markets (Jacquet and Pauly, 2008), and a number of other competing purchasing factors are all barriers that challenge a campaign’s effectiveness (Mackenzie-Mohr and Smith, 1999; Mainier et al., 1997).

Seafood is a global market where much of the production occurs outside of the consumer’s field of view. Many consumers are unaware of where their seafood comes from and how it is harvested, which decreases their preferences for sustainable seafood over conventional forms (Johnston et al., 2001). Studies show that heightened awareness of environmental issues increases a consumer’s level of concern and influences pro-environmental attitudes. Nevertheless, raising awareness is insufficient on its own (Von Borgstede and Biel, 2002). Consumers must be able to know what action(s) they can take and how their contributions will incite change (Dutton and Duncan, 1987). One of the best ways for consumers to create change is by leveraging their purchasing power.

In many cases, consumers do not have access to information regarding environmental impacts of products, which decreases their ability to make decisions that are in the best interest of their welfare and the welfare of the environment (Wessells, Johnston, Donath, 1999). Over the last decade, food and health scares, and environmental degradation have put the food industry under severe scrutiny, which has increased the demand for environmentally-friendly goods (Nilsson, Tuncer and Thidell, 2004). The market has responded to this new niche by bombarding consumers with an array of goods labeled as ‘all natural’, ‘organic’, and ‘green’. In the midst of today’s ‘greenwashing’, comprehensive seafood labeling still remains limited and and often deceptive (Jacquet and Pauly, 2008), making it difficult for consumers to assess the sustainability of the seafood they buy. Recently, the USDA mandated large retailers to label unprocessed fresh seafood with its country of origin and whether it is farmed or wild, allowing consumers to make more informed choices (USDA, 2004). Many labels, however, still lack information on how seafood is caught (longline, trawlnet, etc.), a key component in determining whether or not
seafood is sustainable. To make matters worse, over one-third of all seafood within the U.S. is mislabeled (Jacquet and Pauly 2007, 2008) further undermining social marketing efforts and consumer attempts to shop more sustainably. Purchasing factors also play a large role in whether consumers choose sustainable products over conventional forms. Most consumers express general environmental concerns, but place more value on taste, price, availability and healthy benefits (Mainier et al., 1997). On the other hand, if consumers are made aware of the health and environmental benefits of sustainable seafood, they may choose sustainable products over conventional forms.

Sustainable seafood marketing campaigns aim to influence consumer awareness and purchasing behavior of seafood on a national level. To some extent this has been well received by particular subsets of the population, usually markets and consumers that already express high levels of environmental participation (Wessells, Johnston and Donath, 1999), however, many of these efforts have not come to fruition (Quadra and Galiano, 2004). Rather than question the effectiveness of current seafood initiatives, I propose a different approach: focus on education and community engagement to make information more applicable to daily life. With increased exposure of local markets and events that support ocean health and sustainable seafood initiatives, and tools to increase consumer awareness and appreciation of seafood concerns, current market barriers can be reduced and consumer participation can increase.

**Part One: Seafood Survey**

**Focus of Study**

In response to the overexploitation of many fisheries, which has resulted in the global decline of fish stocks and decimation of marine habitats, seafood awareness programs have formed in attempts to increase transparency of seafood markets and educate consumers on sustainable options. The question remains: How can nationally scoped programs, aimed at examining seafood market inefficiencies as a whole be made more relevant and applicable to consumers on a local scale?
Survey Creation and Questions

To match the needs and wants of San Diego consumers with respect to local sustainable seafood markets and goods and promote large-scale sustainable seafood initiatives, two surveys were used to gain a better understanding of: 1. consumer preferences and 2. purchasing behavior for seafood, 3. general consumer valuation for sustainable seafood, 4. knowledge of seafood-related programs and 5. preference for a Internet-based seafood resource guide. (Appendix A) The surveys were created on Zoomerang.com, an online survey software tool.

Survey Methods

The survey was implemented using two methods: (1) In-person and (2) web-based surveys. In-person surveys were conducted in front of retail stores (Henry’s, Trader Joes, Vons, and Ralphs) in the cities of Chula Vista and La Jolla. Individuals were randomly asked to participate in a survey regarding seafood. A script was developed and implemented while conducting surveys to limit selection bias and retain consistency when respondents were approached (Appendix A). In-person surveys began on 3/15 and ended on 3/21 and were conducted during weekdays and weekends between 11AM and 8PM. A total of 106 in-person surveys were collected.

Web-based surveys were conducted using the Internet and targeted individuals on large-mailing lists and blogs. Selected individuals received an email inviting them to participate in a ‘Seafood Survey’ and were provided a link, hosted by zoomerang.com. Individuals were also asked to freely distribute the survey to their family, friends and coworkers, at their own discretion. Web-based surveys started on 2/23 at 1:29PM and ended on 3/21 at 1:24 PM. A total of 417 web-based surveys were collected.

All participating subjects were 18 years of age, or older.

Before to conducting the surveys, permission was granted by the UCSD’s Institutional Review Board (IRB). Permission was required because the study involved the use of human subjects.
Results

A total of 523 surveys were collected through the use of in-person and web-based surveys. Respondents living within the greater San Diego area completed 445 of the 523 surveys. Only surveys taken by respondents living within San Diego County were used for the purpose of the study.

Survey Distribution and Demographics

![Survey Cities Pie Chart]

<table>
<thead>
<tr>
<th>Table 1: Survey Cities</th>
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<tr>
<td>Campo</td>
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<tr>
<td>Chula Vista</td>
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<td>Imperial beach</td>
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<td>Jamul</td>
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<td>La Mesa</td>
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<td>National City</td>
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**Figure 1:** A total of 23 of the 46 communities that make up San Diego County are represented. Cities with the largest representation are San Diego city (51.91%), La Jolla (21.04%) and Chula Vista (9.86%) (Table 1).

![Age of Respondents](image)

**Figure 2:** The age of respondents range from 20-95 years of age, with the largest proportion representing age group 26-30 years of age (22.37%).
Figure 3: The average San Diego County household contains 2.44 persons compared to 2.73 persons per household, a survey taken by the US Census Bureau in 2002 (U.S. Census Bureau, 2009).

Consumer Eating and Purchasing Behavior

Top Seafood Choices
**Figure 4:** Respondents to statement ‘What seafood do you consume the most?’ consume salmon the most (35.3%), followed by tuna (25.0%) and shrimp (20.8%). Compared with the NOAA’s Fisheries Service study, shrimp remains the top choice amongst seafood consumers (4.1 pounds/person) followed by canned tuna (3.9 pounds/person) and salmon (2.4 pounds/person) (Voorhess and Pritchard, 2008).

![Frequency of Seafood Meals](image)

**Figure 5:** The largest majority of respondents eat seafood 1-3 times per month (41%). The second largest proportion on respondents (35%) eat seafood 4-6 times per month. Total consumption in weight was not measured, but a survey by NOAA Fisheries Service reports the average American consumes 16.3 pounds of seafood a year (Voorhess and Pritchard, 2008).
Figure 6: The seafood survey indicates that most respondents consume seafood meals outside the home, for example restaurants, independent of how much they consumer on a monthly basis. A study by the Seafood Choices Alliance and Greenpeace confirm that most Americans split their seafood purchases equally between restaurants and retail stores (for at home consumption) (Seafood Choices Alliance, 2008; Greenpeace 2009).

<table>
<thead>
<tr>
<th>Table 2: Preference for Seafood Products</th>
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<tr>
<td><strong>Seafood Product</strong></td>
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<td>---------------------</td>
</tr>
<tr>
<td>Fresh</td>
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<tr>
<td>Frozen</td>
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<tr>
<td>Canned</td>
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</table>
Table 2: Popular responses to why respondents eat and do not eat certain seafood products

![Bar chart showing Seafood Product Purchases](image)

**Purchases (per month)**
- Blue: Fresh
- Green: Frozen
- Orange: Canned

**Figure 7**: Respondents purchase more fresh seafood than frozen and canned in every category greater than 0 times per month. Fresh purchases also include purchases made at restaurants.
**Consumer Preferences**

![Preference for Seafood Products](image)

**Figure 8:** A majority of respondents have a 'high' preference for fresh seafood (92%) over frozen and canned forms. Frozen seafood has the largest 'medium' preference (83%) and canned seafood is the least preferred (81%). Individuals eat seafood for a number of reasons (Figure 9), but it is less clear why people eat certain seafood products (fresh, frozen or canned) more frequently over others. Respondents are asked to explain why they prefer fresh, frozen and canned over one another. A list of the more popular responses are provided in Table 2.
Figure 9: Taste is the leading reason respondents eat seafood (45%). Health/Nutrition is the second most common reason respondents choose to eat seafood (35%). 'Other' reasons for eating seafood include exotic preferences. A survey conducted by the USDA finds that the increase in demand for variety and exotic foods among consumers is expected to grow and thus influence the increase in per capita consumption of seafood within affluent nations. (USDA, 1998)
Figure 10: When asked ‘Rank the following factors that influence the kinds of seafood you purchase’ 42.1% of respondents rank quality as a number one factor. Sustainability ranks third (medium preference) (28.5%) among all five factors.

![Preference for Website Information](chart)

Figure 11: Most respondents, with interests in an Internet-based seafood guide, have ‘increased interests’ in information that pertains to local restaurants and markets listings (76%) and a resource guide to learn about how, what and where to buy and eat seafood (67%). Most Respondents (79%) show ‘no interest’ in a Seafood-based forum.
**Sustainability Preference vs. Other Factors**

**Figure 12:** Age groups between 21 and 40 years show the highest preference level for sustainability, when eating and purchasing seafood.

**Gender vs. Preference for Sustainability Factor**

**Figure 13:** Women are found to have a higher preference level for sustainability when eating or purchasing seafood compared to men. A study assessing consumer preferences for ecolabeled
seafood found that women tend to select certified sustainable products over conventional forms more often than men (Wessells, Johnston, Donath, 1999).

![Willingness To Pay Sustainable Seafood Premium](image)

**Figure 14:** A majority of respondents show a willingness to pay a premium for sustainable products of 10-20% (34%) and 20-30% (28%). There are a number of known factors that may play a large role in a respondents willingness to pay. Studies that assess consumer preference of ecolabeled goods and effectiveness of seafood-related programs find income effects, education level and prior knowledge or affiliation with an environmental group, affect a consumer’s purchasing behavior (Blisard, 2002; Kemmerly and Macfarlane, 2008; Wessells, Johnston, Donath, 1999; Gulbrandsen, 2009).
**Knowledge of Seafood Programs**

![Bar chart showing the number of respondents aware of different seafood programs.](image)

**MBA:** Monterey Bay Aquarium-Seafood Watch Card, **BOI:** Blue Ocean Institute-Friendly Seafood Guide, **EDF:** Environmental Defense Fund-Seafood Selector, **NOAA:** Fishwatch

**Figure 15:** Respondents are asked to note which seafood programs they currently use or recognize. The largest proportion of respondents noted they were aware of the Monterey Bay Aquarium Seafood Watch Card (45%). Since 2000, the Monterey Aquarium has given out over 2 million Seafood Watch Cards within their aquarium and over 20 million cards through their partnerships and events (Kemmerly and Macfarlane, 2008). A study finds that seafood wallet cards do increase awareness of sustainable and unsustainable seafood, but a large number of barriers that exist in the market prevent consumers, wanting to make environmental conscience decisions, from effectively creating a shift in market demand and thus reducing the market’s negative impact on the marine environment (Quadra and Galiano, 2004). A major challenge is to increase the awareness of seafood-related programs, as a whole. The second largest majority of respondents are unaware of any sustainable seafood programs (32%).
Figure 16: Respondents with prior knowledge of sustainable seafood programs show an increased willingness to pay for a seafood premium in all categories above 0-10%.
Figure 17: Respondents with prior knowledge of sustainable seafood programs show an increased preference for sustainability when eating or purchasing seafood.

Survey Limitations

The sample of respondents throughout San Diego County lacks even distribution. A large majority (83%) of respondents were found to live in only three of the 46 communities throughout San Diego County. Many communities located further inland and north of La Jolla were underrepresented. Seafood and sustainability preference may vary among different communities within the San Diego County. To communicate sustainable seafood initiatives in the most effective way possible, it is important to best represent the needs and wants of a majority of local San Diego residences.

To understand how preference for sustainability varies amongst individuals, it is important to extract a number of factors from consumer preferences and purchasing behavior.

Two factors that are neglected in the Seafood Surveys are income and education level. Studies show factors, such as these, can increase the weight on whether an individuals makes the conscious choice to purchases seafood products harvested in a sustainable manner over conventional forms. Income effects are a major driver on per capita expenditures (Blisard, 2002). The U.S. Department of Labor’s Bureau of Labor Statistics show higher incomes will increase the demand and consumption for foods high in quality, complexity and convenience, rather than quantity. Seafood is considered to be of higher quality compared to other meats (beef, pork and other meats) Nevertheless, studies show increases in income will also influence the purchase of more sustainable forms of seafood over conventional forms, when made aware of the option (Kemmerly and Macfarlane, 2008). Education also has a moderate influence on shifts in food consumption and further reinforces changes made by expected income growth. Individuals with higher educations overall have an increase awareness and knowledge of their diet and health issues, which favors the consumption of certain foods over others (Blisard, 2002).
The survey did not draw any conclusions on the value for sustainability based on the types of seafood species or products respondents eat and purchase. A number of seafood species and products can be found in sustainable and unsustainable forms. I believe barriers such as consumers knowledge of seafood sustainability, inadequate and deceptive labeling and a number of seafood products and species that exist both in sustainable and nonsustainable forms prevent this distinction from being made.

Strong conclusions were neither made for respondents willingness to pay (WTP) a premium for seafood harvested in a sustainable way. The premium for seafood harvested in a sustainable manner does not represent a true market value, rather a consumer’s willingness to pay for the indirect use value of the sustainability attributes of seafood. Contingent valuations are used to capture non-market values and are subject to a number of biases (Tietenberg and Lewis 2009). The seafood survey was not designed to address potential biases, therefore results examining a respondent's WTP can only be used to infer particular preferences.

Potential biases:
- Actual premiums may vary depending on the price of specific seafood and therefore could reduce or increase a respondent’s WTP.
- Most contingent valuations are accompanied with an introductory section that thoroughly describes the specific attributes of the good or service in question and the issues surrounding it, so that respondents are well-informed about what they are valuing.
- Often surveys that examine WTP are written in such a way that the respondent thinks the price change will occur, say from a new policy or tax proposal. Respondent’s tend to give more truthful answers when they think their answer will directly influence them.
- The WTP question is open ended, which can also induce a bias. Many contingent valuations give respondents on price to select ‘yes’ or ‘no’ to, and then vary the price across respondents.
Additional Thoughts

The leading objective for conducting a San Diego countywide survey of consumer preferences, behavior, etc., is to better understand the need and wants of San Diego consumers to market sustainable seafood in the most effective manner possible. Through the survey, I learned a great deal about consumer attributes as well as the many obstacles that can impede future efforts.

San Diego County is a perfect location to promote sustainable seafood initiatives. The county spans across 70 miles of U.S. coastline and is populated with over 3 million residences (US Census Bureau, 2008), within 46 different communities. A majority of the San Diego population lives along the coast, and residences are exposed to a number of unique goods and services provided by the marine environment. From a lively fishing community to world renowned research institutes (Scripps Institution of Oceanography, South West Fisheries Science Center, Seafood Choices Alliance, Hubbs Seaworld Research Institute, etc.), local citizens have a number of resources that allow them to become more aware and appreciative of sustainable seafood.

As discussed earlier, many consumers are far removed from the full scope and complexity of seafood sustainability. There are many factors that must be considered to fully assess the sustainability of seafood products. Factors include:

- Is the product farmed or wild-caught?
- Where is caught?
- How is it caught?
- Is it seasonal?

These are all important questions that must be considered, but unfortunately much of this information is not available in retail stores and to consumers. By bringing light to today’s current state of seafood while promoting venues and products where increased transparency exists, consumers can become more aware about the seafood they buy, while providing them with knowledge on how to shop more sustainably.

Most consumers eat seafood because it is tasty and regarded as a healthy form of protein
(Figure 9). Also, most consumers prefer fresh seafood over frozen and canned forms (Figure 8); associating fresh with higher quality and better health (Table 2). One must ask though, how closely associated is a type of seafood product (fresh, frozen and canned) with quality and health, and are there other factors that consumers should consider?

Recent media exposure of the associated health benefits with eating a diet high in seafood has increased the demand for seafood and have placed more pressure on current fish stocks. While many markets promote seafood’s healthy attributes, many neglect to inform their patrons that seafood also poses a number of health risks. Seafood, a leading cause of foodborne illness outbreaks in U.S., is responsible for 15 percent of the 76 million cases reported annually (GAO, 2001). Seafood is also one of only a few food products to contain high levels of methylmercury and Polychlorinated biphenyles (PCB’s), toxins known to be detrimental to human health. The use of the word ‘fresh’ is also abused in many retail stores and restaurants. Seafood is an international market where many products are caught and shipped around the world during different times of the year. Many times, fresh fish or fillets are frozen for months at a time before making it to a store’s fish counter or restaurant plate.

Seafood health, quality and sustainability is not a ‘cut and dry’ issue. As mentioned before, there are many factors that determine what products are best. For example, salmon has made its way to the top of the charts as the third most consumed seafood product in the nation (Blisard, 2002) (ranked number one in the 2009 Seafood Survey, Figure 4) for its great taste and high nutritional content. Nevertheless, a fresh farmed fillet of salmon is not nearly as good for you as canned wild salmon, or as sustainable. This example is not unique when it come to deciphering the between different products. The topic is complex and confusing to most consumers and with persistent mislabeling and deceptive campaigning many consumers are at a loss. I believe, generic schemes, such as ‘fresh is best’ need to be replaced with the promotion of specific products that support both the health of the consumer and the environment. The benefits for buying sustainable seafood over conventional forms have not yet been realized by many consumers. Nevertheless, by portraying sustainable seafood as affordable, healthy and of high quality, its value and selection preference may increase. It is also important to bring about awareness of local seafood sources. Seafood grown or caught locally is more likely to be fresher,
caught more sustainably and chances are it may be easier to trace just where, when and how it was caught.

If consumers knew there was a difference between sustainable seafood and conventional forms would they change their behavior? Many studies suggest with increased awareness and transparency of products many consumers would alter their purchasing behavior. (Kemmerly and Macfarlane, 2008; Mainieri et al., 1997; Von Borgstede and Biel, 2002; Wessells, Johnston and Donath, 1999). This can be compared to what has been seen with the organic food movement.

Organic food has made a considerable mark in the food production industry and eco-labeling markets. The organic food movement was created to address issues of inefficiency revealing the true costs of production. Recent food and health scares have put the food industry under severe scrutiny, while allowing rapid consumer acceptance and market share growth of organic foods (Nilsson, Tuncer and Thidell, 2004). Since 2000, the organic food market has formed a $10 billion dollar a year industry with growth exceeding 20 percent a year (Raynolds, 2000). Many consumers are willing to pay more for organic foods with the assumption that it is healthier than conventional forms (Kaiser, 2006). Nevertheless, organic food mainly address minimizing damages to the environment and wildlife by limiting the use of fertilizers and chemicals on crops and provide little to no additional nutritional benefits for the consumer. Regardless, the organic food market has formed solid consumer backing and has created incentives for producer participation.

When the organic food movement began, its marketing strategy was to support local production and consumption, helping to shorten the gap between consumer and producer. This helps increase consumer trust and knowledge of organic products and its eco-label results in greater consumer acceptance and product loyalty, while creating more incentive for producer participation (Nilsson, Tuncer and Thidell, 2004; Raynolds, 2000). Sustainable seafood and organic foods counter traditional inefficient production methods that undervalue its resources and their associated environments, but the sustainable seafood initiative has not received the same consumer acceptance and producer participation as seen with the organic food movement (Kaiser, 2006; Johnston et al., 2001).

It is important now to make sustainable seafood more visible and valuable to consumers to
create a more solid consumer backing and increase producer participation. By focusing on particular products and supporting local venues, I believe consumers will increase their demand for sustainable goods and therefore be able to act in the best interest of their health and the health of the environment.

**Part Two: InFishWeTrust.com**

With marine living resources hanging on by a delicate thread, many marine-related non-government organizations (NGOs) are bypassing Washington D.C. and heading straight into social marketing campaigns to educate and encourage consumers to adopt more sustainable buying practices (Jacquet and Pauly, 2007). A number of NGOs use the Internet as a tool to promote their sustainable seafood programs (e.g. Monterey Bay Aquarium, Blue Ocean Institute, Environmental Defense Fund, Greenpeace, etc.). The Internet is a growing force within Communications, used by a wide variety of individuals, organizations and businesses, to convey their information to the general public (Kotler and Armstrong 1999; Sahlin and Snell, 2007). The Internet allows information to be distributed amongst a large diverse audience in an easily managed, cost-effective manner. Today’s technologies allow easy access to the Internet almost anywhere at anytime within most developed areas, allowing users to conveniently access sites around their own schedules. The ability to easily update and manage websites also provides users with the most up-to-date information.

One challenge a website faces is developing a web presence that effectively reaches and engages targeted demographics. Millions of sites make up the Internet and a new website can easily become lost. Nevertheless, with the use of marketing tools and a well-organized and comprehensive layout, that addresses the needs and wants of its customers, a website can successfully standout amongst the crowd.

**Development**

A number of marketing tools are used to ensure effective communication of sustainable seafood initiatives to consumers within San Diego County. Tools include a perceptual map to determine what niche a website should fill amongst other existing seafood sites, and a series of
seafood surveys to determine the needs and wants of local San Diego consumers to effectively promote sustainable seafood initiatives.

First, I developed a Perceptual Map (Figure 18) to graphically represent what niche a website would fill among other competing seafood-related websites currently found throughout the Internet. I used two dimensions, sustainable/unsustainable and local/nationwide and placed each website in its corresponding place within the map. After the completion of the perceptual map, a void was represented in the upper left quadrant which satisfies the need for a website with sustainable and local dimensions.

![Perceptual Map](image)

**Figure 18:** Perceptual Map - graphical representation of a website's role, with regards to seafood sustainability and audience scope. (Each number represents one website)

Second, a series of surveys were conducted to gain a better understanding of: 1. consumer preferences and 2. purchasing behavior for seafood, 3. general consumer valuation for sustainable seafood, 4. prior use of knowledge of seafood-related programs and 5. preference for an Internet-based seafood resource guide. The results from the surveys were then used to match
the needs and wants of San Diego consumers with local sustainable seafood markets and goods and promote large-scale sustainable seafood initiatives.

Design

The InFishWeTrust.com site is designed to provide a comprehensive resource guide to increase awareness of issues that surround our current seafood market and provide general seafood consumers a guide on how, what and where to eat and purchase more sustainable seafood products within San Diego County.

Site map of InFishWeTrust.com

Home page - Introduction to InFishWeTrust.com, and highlights for specific website features.

Seafood Tips & Tricks - Tools for visitors to learn how, what and where to buy their seafood.

Link Up - Ways to learn about seafood and sustainability in more detail, and tools to become involved in local and nationwide food initiatives.

Fish Tales - A community forum to discuss specific questions pertaining to seafood and sustainability.

Featured product - Every month a product is featured along with a corresponding recipe. The goal is to highlight specific products that support sustainability, are affordable, convenient, and available in most stores to most consumers.

Events - A listing of events within San Diego County that support ocean health and promote sustainable seafood initiatives.

Restaurant & Markets - A listing of local venues that provide increased transparency of their good, local products and sustainable seafood options for consumers.

About InFishWeTrust - The motivations behind the development of In Fish We Trust.

Contact - Information for visitors to contact In Fish We Trust.

Survey - A tool for visitors to supply their comments and suggestions regarding the In Fish We Trust website.
Deploy (Launch)

As of May 20, 2009 the website InFishWeTrust.com was launched. A number of advertising schemes were developed through the use of the Internet (Twitter, Facebook, bulk email invitations) and promotional material (press release, flyers - Appendix C) to help promote the awareness of the website throughout San Diego County. To measure the effectiveness of the InFishWeTrust.com a feedback survey (Appendix B) was provided on the website for visitors to provide comments on the site’s content, layout, usefulness, functionality, etc.

Next Steps:

Since the launch of InFishWeTrust.com, 770 individual IP addresses have visited the site (June 4, 2009). The site’s feedback survey has provided a great deal of insight on how the site has been received by visitors and on improvements that can be made in the future to better address the needs and wants of San Diego seafood consumers. A majority of respondents (75%) like the site ‘just how it is’ and a remainder of respondents (25%) would like to see improvements in the site’s layout. The most popular features of the website are the Restaurant/Market listings and the Market Scorecard. The next most popular features include the Fish Tale community forum and Events listing. Respondents have requested that they would like to see more restaurants and markets listed in the future and that they are also interested in having more information about specific fish species.

The InFishWeTrust.com site will continue to evolve to better address the needs and wants of San Diego consumers and support sustainable seafood initiatives. Future work will include collaboration with local food organizations to incorporate sustainable seafood within existing programs to help increase dialogue between these organizations and members of the community. Other efforts will be developed to further educate and motivate consumers to demand more sustainable options and transparency with their markets, and to support organizations and policy that seek to improve fisheries management and the the health of our oceans.

‘Never doubt what a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.’ - Margaret Mead
Acknowledgments:
Thank you to my Capstone Advisory panel: Dr. Ayelet Gneezy, Rady School of Management; Dr. Kathryn Mengerink, SIO; and Dr. Brian Goldfarb, Communications Department, UCSD.
References


Appendix A: Survey Script, Seafood Survey (1), Seafood Survey (2)

2009 Seafood Survey (1)

Script for Surveyor

Smile!

"Hi there _____ (ma'm, sir, ladies, or guys). How are you doing today? I’m a UCSD graduate student conducting a short survey concerning seafood. Would you be interested in helping me out today? You would also be entered in for a chance to win a free $25 Visa gift card.

If ‘no’ or ‘I don’t eat seafood’…
Smile!
"Ok. Have a great _____ (day, evening, night)

If ‘yes’…
Smile.
"Thank you for your help!"
Hand over clipboard and pen.
"If you have any questions regarding the survey please let me know."

Questions asked regarding survey…
"I’m conducting a survey to learn more about seafood consumer preferences within San Diego."

2009 Seafood Survey Questions (1)

I am a Master’s student at the Scripps Institute of Oceanography (UCSD) and I am interested in learning more about the types of seafood that people consume both at home and when eating out. This survey is intended for individuals who purchase and/or eat seafood on a fairly regular basis. The survey results will help me develop a website on sustainable* seafood.

* Sustainable seafood is fished or farmed in ways that have less of a negative impact on marine animals and their habitat.
If you would like to enter for a chance to wind a free $25 Visa gift card please provide your email address below at the end of the survey. Because your privacy is very important your responses and identifying information will be kept confidential.

Thank you for you for participating in the survey. Your feedback is very important.

1. How often do you eat seafood (per month)?
   - 1-3 times per month
   - 4-6 times per month
   - 7-9 times per month
   - 10 times, or more, per month

2. What kind of seafood do you consume the most? Please choose one.
   - Shrimp
   - Salmon
   - Tuna
   - Tilapia
   - Shellfish
   - Other (please specify)

   [additional text]

3. How often do you purchase each type of seafood product (per month) ?

<table>
<thead>
<tr>
<th>0 times per month</th>
<th>1-2 times per month</th>
<th>3-4 times per month</th>
<th>5-6 times per month</th>
<th>7-8 times per month</th>
<th>9, or more, times, per month</th>
</tr>
</thead>
</table>

Fresh:

| 1 | 2 | 3 | 4 | 5 | 6 |

Frozen:

| 1 | 2 | 3 | 4 | 5 | 6 |
4. Rank the following factors that influence the kinds of seafood you purchase. Draw a line to connect each factor with its associated number (1= least valuable, 5= most valuable). Please select each number only once.

<table>
<thead>
<tr>
<th>Quality</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>2</td>
</tr>
<tr>
<td>Sustainability</td>
<td>3</td>
</tr>
<tr>
<td>Availability</td>
<td>4</td>
</tr>
<tr>
<td>Health</td>
<td>5</td>
</tr>
</tbody>
</table>

5. Would you be willing to pay a premium for sustainable seafood? If yes, how much?

<table>
<thead>
<tr>
<th>0-10%</th>
<th>10-20%</th>
<th>20-30%</th>
<th>30-40%</th>
<th>40-50%</th>
<th>More than 50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

6. How often do you eat seafood when dining out (per month)?

- ☐ 0-1 times per month
- ☐ 2-3 times per month
- ☐ 4-5 times per month
- ☐ 6-7 times per month
- ☐ 8-9 times per month
- ☐ 10, or more times per month

7. Are you familiar with sustainable seafood programs? If yes, what programs/guides have you used?

- ☐ Seafood Watch Card - Monterey Bay Aquarium
- ☐ Guide to Ocean Friendly Seafood - Blue Ocean Institute
- ☐ Seafood Selector – Environmental Defense fund
- ☐ Fish Watch – NOAA
- ☐ Other (please specify)
8. If you had access to a sustainable seafood website what type(s) of information would you use? Please rank 1= no interest, 2= little interest, 3= increased interest.

<table>
<thead>
<tr>
<th>No interest</th>
<th>Little interest</th>
<th>Increased interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainable seafood recipes</td>
<td><img src="image" alt="Ranking Table" /></td>
<td></td>
</tr>
<tr>
<td>List of Sustainable seafood restaurants/recipes</td>
<td><img src="image" alt="Ranking Table" /></td>
<td></td>
</tr>
<tr>
<td>Resource guide for selecting sustainable seafood</td>
<td><img src="image" alt="Ranking Table" /></td>
<td></td>
</tr>
<tr>
<td>Links to other sustainable seafood programs</td>
<td><img src="image" alt="Ranking Table" /></td>
<td></td>
</tr>
<tr>
<td>Seafood discussion forums</td>
<td><img src="image" alt="Ranking Table" /></td>
<td></td>
</tr>
<tr>
<td>Other seafood related information</td>
<td><img src="image" alt="Ranking Table" /></td>
<td></td>
</tr>
</tbody>
</table>
9. General Information

Gender ________________________

Age _________________________

Number of Persons in household ________________________

ZIP Code ______________________

10. Please enter your email address in the space below for a chance to win a free $25 Visa Gift Card.

Email Address ____________________________

2009 Seafood Survey Questions (2) (web-based only)

1. Do you eat seafood? Do you eat seafood? If you answer 'no' to this question, please skip to question 4.

2. I eat seafood because ____________. (Select all that apply)

☐ Healthy/nutritious
☐ Affordable
☐ Tasty
☐ Convenient
☐ Safe to eat
☐ Other, please specify ______________________

3. Rank in order of preference what kind of seafood you prefer to eat (1=high preference, 3=low preference). Please select each number only once.

Fresh:

1  2  3
Briefly explain your ranking

Frozen:
1   2   3

Briefly explain your ranking

Canned:
1   2   3

Briefly explain your ranking

4. Gender
   Male
   Female

5. ZIP Code
   ___________________________
Appendix B: InFishWeTrust.com Feedback Survey

Website Feedback Survey

Please take a few moments to complete our 2-minute satisfaction survey. Your responses will help us improve the web site and better serve your needs. All responses will be kept confidential and will not be used for any purposes other than research conducted by InFishWeTrust.

Thank you for participating in the survey.

1. How did you hear about this site?
   - [ ] Newspaper
   - [ ] Search engine
   - [ ] Another web site
   - [ ] Flyer
   - [ ] Friend or family member
   - [ ] Other, please specify ________________

2. What feature(s) have you enjoyed the most?
   - [ ] Tips & Tricks
   - [ ] Restaurant/Market Guide
   - [ ] Link Up
   - [ ] Fish Tales
   - [ ] Market Scorecard
   - [ ] Events
   - [ ] Featured Product
   - [ ] Other, please specify ________________

3. What is it about the site that you would most like to see improved?
   - [ ] Navigation
   - [ ] Layout
   - [ ] Visual appeal
   - [ ] Content
4. What changes or additional features would you suggest for this web site?

5. How likely are you to return to this web site?

<table>
<thead>
<tr>
<th>Extremely likely</th>
<th>Likely</th>
<th>Not sure</th>
<th>Unlikely</th>
<th>Extremely unlikely</th>
</tr>
</thead>
</table>

6. How likely are you to recommend this site?

<table>
<thead>
<tr>
<th>Extremely likely</th>
<th>Likely</th>
<th>Not sure</th>
<th>Unlikely</th>
<th>Extremely unlikely</th>
</tr>
</thead>
</table>

7. Age

- □ 21 and Under
- □ 22 to 34
- □ 35 to 44
- □ 45 to 54
- □ 54 to 64
- □ 65 to 75
- □ 75 and Over

8. Gender

- Male
- Female

9. ZIP Code

_________________________
Appendix C: InFishWeTrust.com Flyer

Have you seen me?

MISSING

InFishWeTrust.com