



## **Oceana Reveals Mislabeled of Iconic Chesapeake Blue Crab**

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### **Executive Summary**

One of the most delicious ways for diners to sample the fruits of the Chesapeake Bay is by eating a Maryland crab cake. The iconic blue crab is the official Maryland state crustacean and a prized catch in the Chesapeake region. The blue crab, popular with many locals and tourists, also underpins the most profitable fishery in Maryland and the Chesapeake Bay, supporting the livelihoods of thousands of local fishermen and seafood businesses.

Unfortunately, Oceana's new seafood fraud investigation has found that even Maryland's favorite seafood dish is not safe from a bait and switch. When diners are expecting the fresh, distinctive flavor of the Chesapeake blue crab, they may instead be served a completely different species, shipped from as far away as Indonesia. Oceana's new report found that 38 percent of the crab cakes sold as locally sourced blue crab, instead contained imported species, most of which are fished unsustainably. This mislabeling rate is consistent with Oceana's previous studies on fish and shrimp. In 2013, Oceana found that one-third of more than 1,200 fish samples were mislabeled according to Food and Drug Administration guidelines. We also found 30 percent of shrimp samples to be misrepresented to consumers in a similar study in 2014.

Seafood fraud encompasses any illegal activity that misrepresents the seafood you purchase, including mislabeling and falsifying documents or adding too much ice to packaging. The species substitution of crab uncovered here inflates the price for consumers, parades imported and sometimes illegally caught crab as local, prevents consumers from making sustainable seafood choices, and harms the livelihoods of local fishermen and seafood businesses. Without traceability that tracks seafood from the fishing boat to the final consumer, this type of fraud will continue to occur. Key information such as the species name, and where, when and how the crab was caught should follow the product throughout the supply chain. Requiring more transparency and full chain traceability will help to ensure that all seafood sold in the United States is safe, legally caught and honestly labeled.

### ***Key Findings***

Oceana collected 90 crab cakes from 86 restaurants throughout Maryland and the nation's capital during the 2014 Maryland crab season and tested them to identify the species used in each dish. Although Oceana attempted to buy crab cakes using locally sourced blue crab, we found the following:

- 48% of the crab cakes tested used crab species from the Indo-Pacific region (44%) and the Mexican Pacific coast (4%)
- In total, we found eight species other than the blue crab present in crab cakes purchased in Maryland and Washington, D.C.
- Crab cakes sold as "Maryland," were mislabeled the most, followed by those sold as "blue crab."
- Nearly half of the species found in the crab cakes we tested are listed as species to "avoid" on seafood guides, while the real Maryland blue crab is considered a "best choice" or "good alternative" depending on where and how it was caught.

- Import data suggests that much of the crab destined for the U.S. arrives at the border already mislabeled.

## Introduction

The blue crab (*Callinectes sapidus*), although mostly associated with Maryland and the Chesapeake region, can be found from Nova Scotia all the way to Argentina. Blue crabs are a type of swimming crab whose hindmost legs are shaped like paddles, and this is reflected in the translation of its Latin name as beautiful, savory swimmer. Throughout its short two to three-year life cycle, the blue crab provides a tasty meal not only for humans but for much of the resident Bay wildlife and is an essential part of the Chesapeake Bay ecosystem. The blue crab also supports the most profitable fishery in Maryland and the Chesapeake Bay<sup>1,2</sup> as well as the livelihood of thousands of local watermen who catch the crab using specialized gear.<sup>3</sup> The Maryland crab industry also supports local crab processors and other workers who hand pick the delicate crab meat and lumps used in local crab cakes, mainly on its Eastern Shore. The Chesapeake blue crab is also popular with many locals and tourists who catch crab recreationally with pots, hand lines, traps and other gear.

Nearly 40 years ago, the Chesapeake Bay supplied half of all blue crab caught in the U.S., but the Chesapeake's bounty has substantially declined in recent years due to heavy fishing pressure, along with environmental factors such as the loss of Bay grasses, low oxygen levels and harsh winters. The dock-side value of the crab harvest for the Chesapeake Bay area was about \$74 million in 2013, but the fishery's decline is estimated to have cost the region about \$640 million since 1998—affecting diners and watermen alike.<sup>4</sup> Now, most of the blue crab caught in the U.S. is fished outside of the Chesapeake Bay.<sup>1</sup> As a result, blue crabs caught in other states and imported blue crab from countries like Venezuela meet much of the blue crab demand in the U.S., while different species of imported swimming crab from the Indo-Pacific supply the balance of the remaining crab demand in Maryland and the Chesapeake Bay region.<sup>5,6,ii</sup> Nevertheless, diners in Maryland and the Chesapeake Bay still often see the iconic local crab advertised on menus in restaurants and at retail markets. As such, we set out to investigate the veracity of these claims.

In the U.S., the blue crab fishery relies mainly on crab pots as fishing gear. While crab pots in the U.S. generally have low mortality for other non-targeted species, the diamondback terrapin, which is a species of conservation concern, is sometimes harmed through this method of fishing. As a result, the Monterey Bay Aquarium's Seafood Watch rates the U.S. crab pot fishery as a "good alternative."<sup>7</sup> On the other hand, Chesapeake Bay blue crabs caught by trotlines are considered a Seafood Watch "best choice." The trotline, a long, weighted nylon rope baited every four to five feet is actively tended and has no bycatch<sup>8</sup>. Internationally, the situation is much different. The lack of adequate fishery management, combined with the use of bottom gillnets and trawl gear that indiscriminately catch many other types of animals, led Seafood Watch to rate swimming crab species from countries in the Indo-Pacific region as ones to "avoid."<sup>iii</sup> These Indo-Pacific countries include India, Indonesia, Thailand, Philippines and Vietnam, all of which have been identified in a recent study as countries who export illegal and unreported crab to the U.S.<sup>9</sup> It is estimated that 10 to 45 percent of crab imported into the U.S. from these countries is a result of pirate fishing. Unfortunately, it is nearly impossible for consumers to make informed, sustainable seafood choices, as most labels do not provide enough information to make a distinction between species. Nearly all of the imported crab species, including those listed as "avoid" by Seafood Watch, are likely described simply as "crab" on restaurant menus.

As part of Oceana's campaign to stop seafood fraud, we looked at what diners in Maryland and Washington, D.C. receive when ordering local or Maryland crab cakes. Crab cakes are made by combining lumps of crab meat with other ingredients and are served broiled, sautéed or fried. Our past research into seafood fraud in the U.S. has examined species substitution, where one type of seafood is

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<sup>i</sup> See Appendix 1

<sup>ii</sup> See Appendix 4, Imports.

<sup>iii</sup> See Appendix 2 Table A1

sold as another. We have found that local or regional seafood favorites are often subject to this bait and switch. For example, something labeled as “wild Gulf shrimp” in the Gulf of Mexico may actually be farmed, or a fish sold as “grouper” in Florida may actually be Asian “catfish.”<sup>10,11</sup> These prized, local seafood items may be rare or in limited supply, and are frequently swapped with cheaper or more readily available species. Our findings led us to explore the Maryland crab cake, an iconic and regional favorite, for the presence of seafood fraud.

## **Oceana Investigation**

Oceana collected crab cakes during the 2014 Maryland crab season between the months of April and September.<sup>iv</sup> We selected restaurants that advertised local, regional or Maryland crab by searching menus online and purchased 90 crab cakes from 86 establishments<sup>v</sup> in Annapolis, Baltimore, Maryland’s Eastern Shore, Ocean City, Washington, D.C. and surrounding Maryland suburbs (Table 1).

<b>Table 1. Locations where Oceana sampled crab cakes</b>	
<b>Region</b>	<b>Number of crab cakes tested</b>
<b>Annapolis</b> (includes Edgewater, Arnold and Bowie)	19
<b>Baltimore</b> (includes Linthicum and Ellicott City)	13
<b>Washington, D.C.</b> (includes Highland, Hyattsville, Silver Spring, Olney and Bethesda)	31
<b>Eastern Shore</b> (includes Cambridge, Easton, Grasonville, East New Market and St. Michaels)	11
<b>Ocean City</b> (includes Berlin and Fenwick Island, DE)	16
<b>All</b>	90

Although the Chesapeake Bay blue crab population can fluctuate wildly from year to year, 2014 was predicted to be a particularly bad year for these crabs early in the season.<sup>12</sup> Since Maryland blue crab harvests struggled at the start of the season, 80 percent of our samples were collected in the later part of the fishing season, during August and September, when supplies are normally more plentiful. Oceana sent the crab cake samples to a lab for DNA testing to identify the type of crab used in each dish. However, the genetic test used to identify whether a crab cake contained blue crab could not distinguish where the crab was originally caught. Because the range of the blue crab extends from Nova Scotia to Argentina, the DNA test could not verify any local sourcing claims, but could only determine whether the crab cake was made of blue crab versus other crab species not found in the region.

If a crab cake sample was described on the menu or confirmed by the server as “blue crab,” or as sourced from Maryland or the Chesapeake region, but did not contain the blue crab species, it was considered to be mislabeled. The Food and Drug Administration (FDA) regulates seafood sold in interstate commerce and provides guidance on the labeling of seafood in the U.S., most notably with their Seafood List.<sup>13</sup> This list contains the acceptable market names for seafood species sold in the U.S, including which species can be called blue crab. While the Seafood List contains nine other species of swimming crab, only one species, *Callinectes sapidus*, may be marketed as “blue crab.” The other nine are all marketed as “swimming crab.” The blue crab is the only edible species of crab fished in Maryland or the Chesapeake Bay, therefore, any other species sold as “blue crab,” “Maryland” or “Chesapeake Bay” crab, are considered mislabeled.

<sup>iv</sup> Three crab cakes were sampled in 2013 for pilot testing of methods and are included in the results.

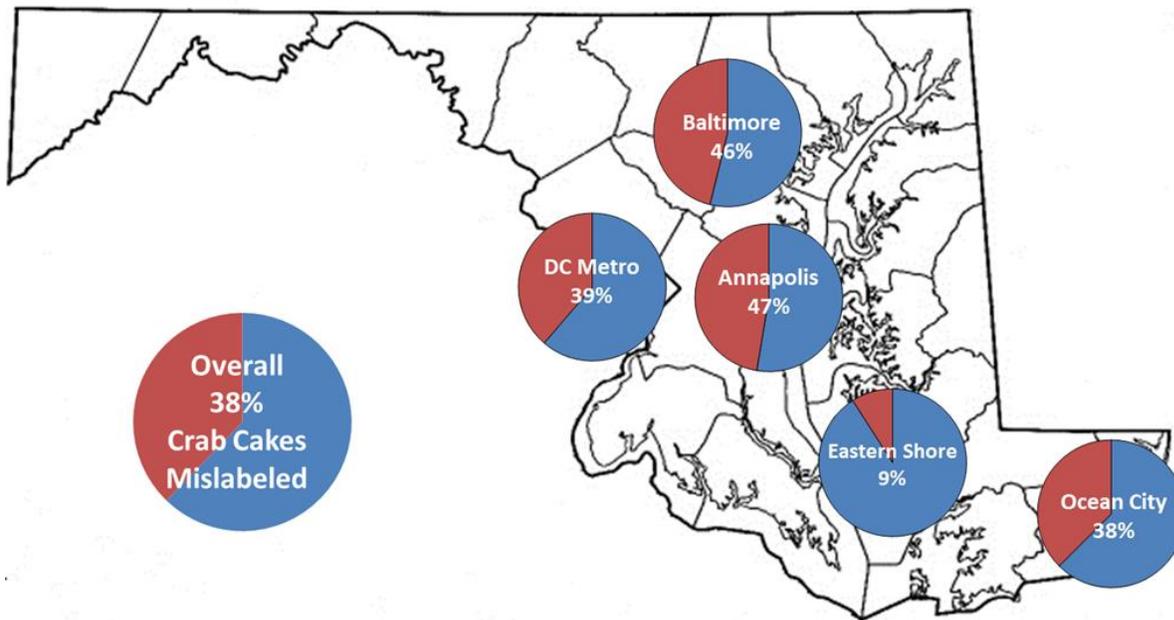
<sup>v</sup> Including two markets, two sporting establishments, one catering truck, and 82 restaurants.

Often, when our crab cake testers arrived at a restaurant whose online menu advertised locally sourced crab, they instead found crab dishes that did not identify the source or species of crab used. We still purchased these vaguely labeled crab dishes to see what they contained, but did not consider them mislabeled if “local” or “blue crab” was not explicitly stated on the menu or confirmed by the server. Crab cakes that did not contain blue crab, but were labeled as “Maryland-style,” were also not considered mislabeled, as “Maryland-style” could simply refer to a recipe or a certain type of seasoning rather than where the crab was actually caught.

## Findings

### Crab Cake Mislabeling

Overall, 38 percent (34/90) of the crab cakes tested in Maryland and Washington, D.C. were not what was advertised (Figure 1, inset). This mislabeling rate is similar to what Oceana found for mislabeled fish (33 percent) and misrepresented shrimp (30 percent).<sup>14</sup>



**Figure 1:** Overall and regional differences in crab cake fraud found in Maryland and Washington, D.C.

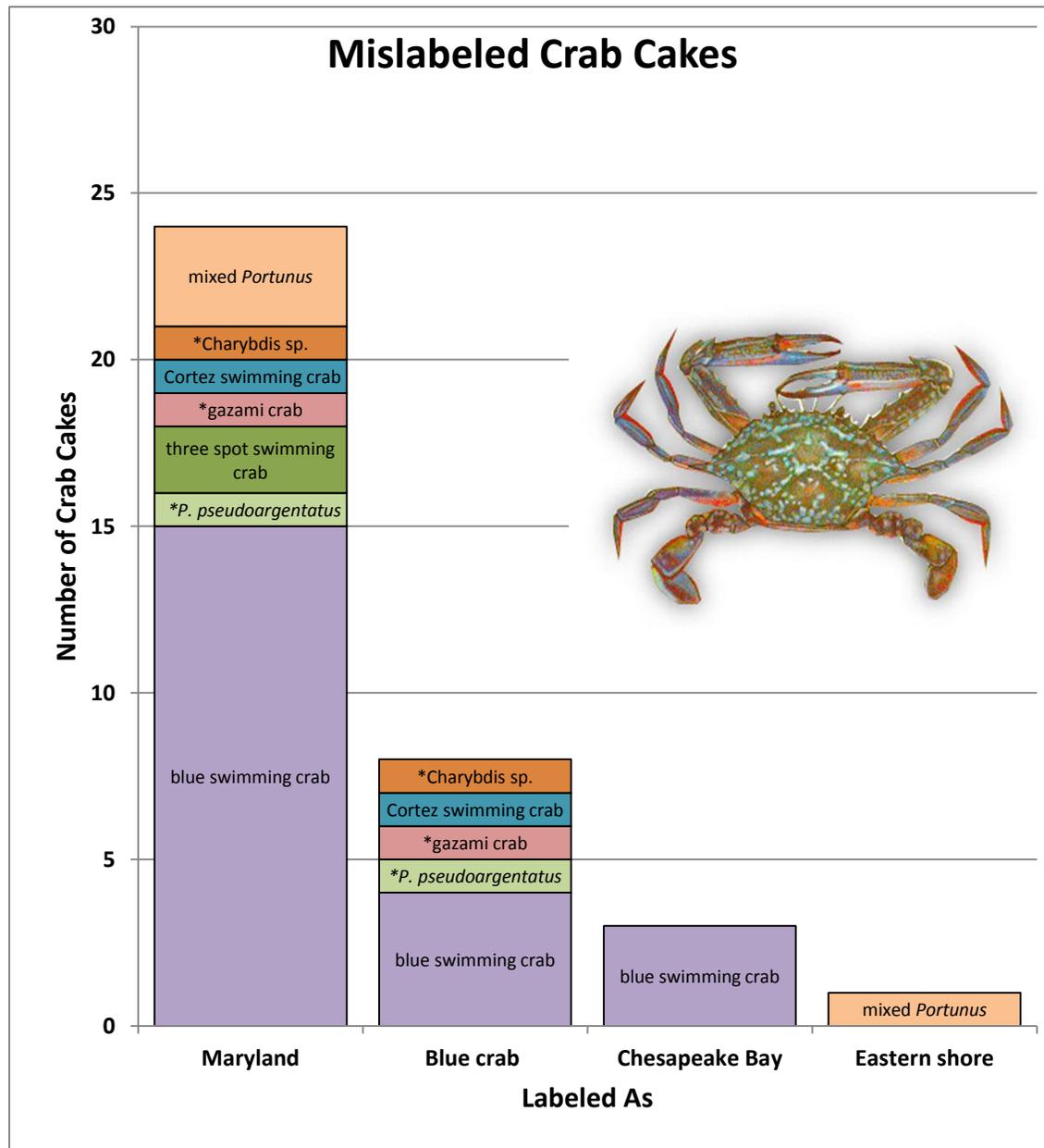
The amount of crab cake fraud varied throughout the region. Crab cakes tested in Annapolis and Baltimore exhibited the highest levels of fraud, with nearly half of the crab cakes mislabeled (47 and 46 percent, respectively). Ocean City and the greater Washington, D.C. region had similar levels of crab cake fraud (38 percent and 39 percent, respectively), while our tests on Maryland’s Eastern Shore resulted in the lowest fraud rate (9 percent), with only one out of 11 samples mislabeled.

### Maryland Crab Swaps

Mislabeled crab cakes sold as blue crab or as sourced from the Maryland region were substituted with other imported swimming crab species, including many from the Indo-Pacific region such as Asia and Australia (Figure 2).<sup>vi</sup> The species most often substituted for blue crab was the Indo-Pacific blue swimming crab (*Portunus pelagicus*). We also found three species in crab cakes not listed on the FDA

<sup>vi</sup> See also Appendix 5, Table A2.

Seafood List and therefore not previously known to be sold in the U.S.: the gazami, *Charybdis* crab and one with no English common name (*P. pseudoargentatus*).



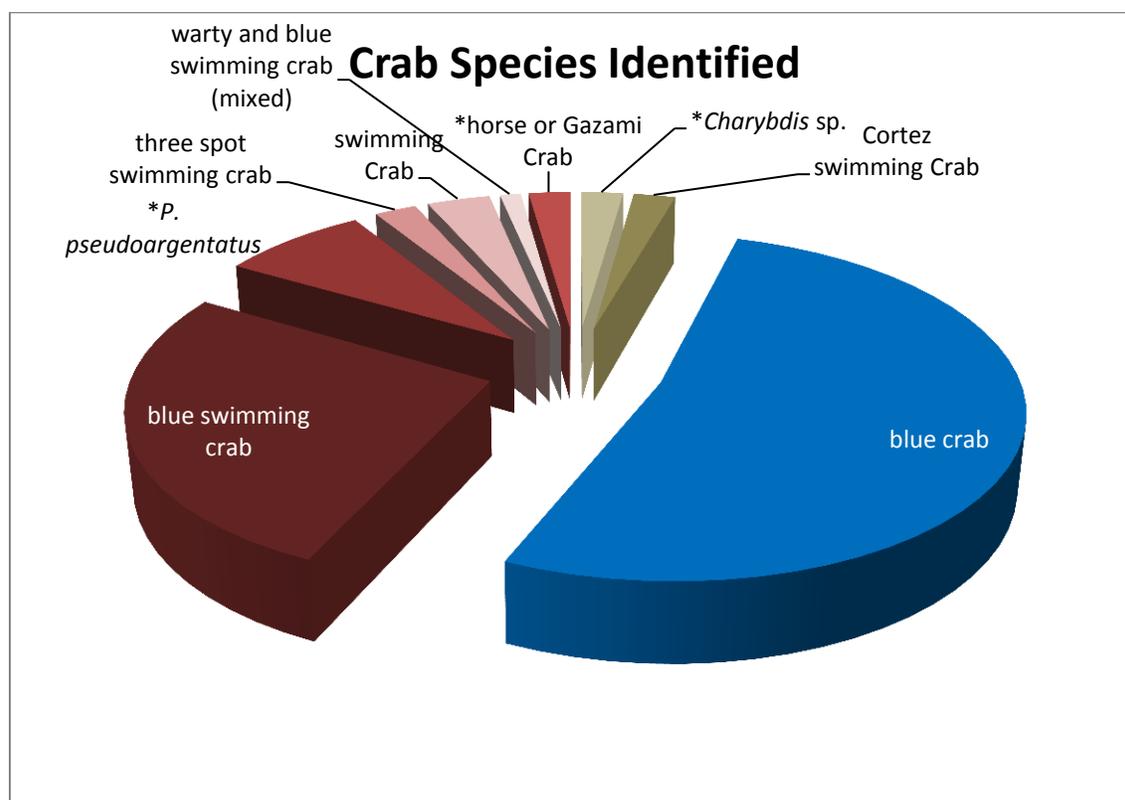
**Figure 2.** Crab species identified in 34 mislabeled crab cakes sold in Maryland and Washington, D.C. “Mixed Portunus” represents the crab cakes that contained more than one type of Portunus crab. Asterisk (\*) indicates crab species not on the FDA Seafood List. The blue swimming crab is a type of Portunus crab, not the local blue crab species (see photo).<sup>vii</sup>

We found one confirmed and three suspected cases of different crab species combined in a single crab cake, none of which contained the local blue crab. The one confirmed case found imported blue swimming crab and red swimming crab blended in a single crab cake, while the other likely mixed-species crab cakes all contained imported crab from the Indo-Pacific region.

<sup>vii</sup> Photo source accessed 3/23/15 from: <http://www.fao.org/fishery/species/2629/en>

## Other Findings

While Oceana attempted to purchase only locally sourced blue crab for this study, nearly half of the species identified were not blue crab, but actually foreign crab imports from the Indo-Pacific region (44 percent) and the Mexican Pacific coast (4 percent)(Figure 3).<sup>viii</sup> These imported crab species were found in both mislabeled crab cakes (those indicated as blue crab on the online menu and then confirmed by restaurant staff as well as those listed as blue crab on the in-restaurant menu) and in correctly labeled, non-descript “crab cakes” that did not provide any information on crab species or origin. In total, we found eight species other than blue crab present in Maryland and D.C. crab cakes, three of which are not listed on the FDA Seafood List.



**Figure 3.** Crab species identified in Oceana’s crab cake testing. Red-hued colors indicate different swimming crab species from the Indo-Pacific. Green colors indicate swimming crab from the Pacific coast of Mexico. Asterisk (\*) indicates that the crab species is not on the FDA Seafood List, one of which lacked a common English name.<sup>ix</sup>

## Consumer Confusion

Oceana sought out a restaurant’s crab cakes if they were advertised as locally sourced, either online or on the print menu. Many of the crab cakes that were advertised online were not always available on the print menu, however, so our crab testers sometimes relied on the server to confirm if the species was Maryland blue crab. About half of the time (6/14) the server misrepresented what was sold. In the few instances (seven) when the online menu indicated locally sourced crab, but our crab testers could not confirm what was being sold by the server, only once was it actually blue crab. This pattern is likely intentional and is supported by the price difference we found between crab cakes labeled as local

<sup>viii</sup> see also Appendix 5, Table A2.

<sup>ix</sup> See Appendix Table A1 for more detail.

compared to those with non-descript labeling. The average price of jumbo lump crab cakes advertised as coming from the Maryland region was \$2.12 higher than those not specifying region or species, indicating a clear economic gain from this swap.

## **Crab Origins**

We attempted to discover, using official government trade data, the origin and amount of blue crab imported to the U.S. during the course of this study, as well as the source countries and amount of the other swimming crab imports that turned up in our crab cake samples.<sup>x</sup> However, identifying the source countries of all the imported crab species we identified, including blue crab, proved difficult. One of the problems with the seafood supply chain is that seafood is often not tracked by species name, which may contribute to mislabeling. The swimming crabs identified in this study, including the blue crab, are no exception. All species of swimming crabs imported in to the U.S. are placed in one of two groups, the Portunidae or the *Callinectes* groups.<sup>xi</sup> The Portunidae group consists of all swimming crabs including the Indo-Pacific *Portunus* crabs and all other crabs identified in this study, while the *Callinectes* group contains just the blue crab (*Callinectes sapidus*) and all other *Callinectes* swimming crab species that are largely found along both coasts of the Americas and Atlantic Ocean.

One surprising find from our investigation is that the U.S. imports the vast majority (90 percent) of the *Callinectes* crab from the countries of Indonesia, China, India, Philippines, Vietnam and Thailand, places where *Callinectes* species are not actually found and therefore not fished (Appendix 4, Figure A1). In fact, from an examination of the most recent 2012 annual data, it appears that the U.S. imported more *Callinectes* crab than is actually fished outside of the U.S. It is clear this import data cannot be correct, and it is likely that imported *Portunus* crab is mislabeled as *Callinectes* before it crosses the U.S. border, which may help explain the results of our study that uncovered large amounts of *Portunus* crab meat in our mislabeled samples.

Because of this suspect and insufficient import data, we could not determine with any certainty the potential origins of the blue crab we tested, and our mislabeling rate is certainly a conservative estimate. There is no tracking of crabs through the supply chain, so it is nearly impossible at this point to differentiate blue crab from the Chesapeake region and blue crab from other domestic and international fisheries. Therefore, even though 52 percent of the crab cakes we tested contained blue crab, we cannot determine if that crab was really locally caught, or if it was instead imported from thousands of miles away or shipped to Maryland from the Gulf of Mexico.

## **Implications of Crab Fraud**

While some crab cake consumers may not be able to distinguish between the taste of domestic blue crab and imported swimming crab, or are indifferent to eating imported crab, others may prefer the flavor and texture of domestic blue crab, or may wish to support the local economy. Many diners may wish to specifically avoid imported Indo-Pacific crab, either because of sustainability concerns or due to the taste of preservatives that are often used in the processed imported crab meat.<sup>15,xii</sup>

Seafood fraud harms the consumer's pocketbook when a less desirable species is substituted for the one they ordered. The low supply of Chesapeake blue crab meant higher prices for crab by the bushel and crab cakes in 2014. We purchased crab cakes from casual as well as fine dining establishments, but one unifying characteristic was that crab cakes were usually one of the most expensive items on the menu, regardless of their sourcing claim. The jumbo lump crab cake is the priciest, and it is easy to understand why, when one considers there are only two jumbo lumps per crab. The price for a single jumbo lump crab cake ranged from \$11.50 to \$30 in our study, however the average price of a jumbo lump crab cake advertised as coming from the Maryland region, on average, charged a higher price (\$18.33) than those

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<sup>x</sup> See Appendix 4 for full discussion

<sup>xi</sup> Portunidae is a taxonomic family that includes all swimming crab, including the *Portunus* and *Callinectes* genera and their species, while *Callinectes* is a genus and contains only *Callinectes* species

<sup>xii</sup> See Appendix 2

not specifying a region or species (\$16.21). Others have reported that crab importers can substantially increase profits if selling imported crab as locally sourced blue crab.<sup>16</sup> Regardless of where along the supply chain the fraud occurs, profit is increased when imported and mislabeled crab is substituted for local blue crab.

Unfortunately, our study found that if consumers try to support the regional economy by purchasing local crab meat, they are often served an imported substitute instead. This economically benefits those who use the Maryland label fraudulently on crab products to enhance their sales, often fooling the unsuspecting public. At the same time, this fraud cheats local watermen and domestic crab processors struggling to make an honest living.

Our testing was only at the restaurant level, so we are unable to identify where the crab substitution occurred, but we do know that seafood fraud can occur anywhere in the supply chain.<sup>17</sup> The observation that mislabeling rates were lowest closest on the Eastern Shore, where Maryland blue crab is fished and likely processed, suggests that shorter supply chains may result in more honesty in labeling.

## **Conclusion**

In order to ensure that all seafood sold in the U.S., including Maryland blue crab, is safe, legally caught and honestly labeled, we need more transparency in the seafood supply chain. Traceability, or tracking seafood from the fishing vessel to the final point of sale, would provide seafood buyers and consumers with more information about the origin of their seafood purchases and build confidence. In March 2015, President Obama's Task Force on Combatting Illegal, Unreported and Unregulated (IUU) Fishing and Seafood Fraud issued their final recommendations, which include international and domestic measures that signify a real commitment to address these global problems. Until the U.S. requires full chain traceability for all seafood products and more information provided at the point of sale, however, seafood consumers will still be subject to this bait and switch.

## **Appendices**

### **Appendix 1: Domestic blue crab landings compared to swimming crab imported into the U.S.**

At the time this report was prepared, the total amount and value of blue crab landed in Maryland and the U.S. in 2014 was unreported. As a result, we looked at the most recent complete data for total domestic blue crab landings and total swimming crab imports using the Commercial Fisheries Statistic database of the National Marine Fisheries Service (NMFS) of the National Oceanographic and Atmospheric Administration (NOAA) for 2013 in order to compare values.<sup>18</sup>

Total U.S. blue crab landings in 2013 were 61,113 metric tons (whole crab). Approximately 36 percent of the total was landed in the Chesapeake, with Maryland accounting for half of that total.

Total imports of swimming crab into the U.S. in 2014 were 17,111 tons, 2,802 tons of which were imported through Baltimore. However, swimming crab weights are not directly comparable to domestic crab landings, because imports are reported as weight of processed crab meat, while domestic landings are for whole crab weight. In order to compare the total imported swimming crab meat weight (17,111 tons) to the landed domestic whole crab weight, a factor of 30 percent was used to convert whole crab weight to processed crab meat weight (range is 20 to 40 percent).<sup>19</sup> We estimate the weight of the 2013 domestic blue crab meat landed to be 18,330 tons (range 12,223 to 24,445 tons). Using these estimates, the amount of imported swimming crab was roughly equivalent to the amount of blue crab landed in the U.S. in 2013.

Appendix 2: Seafood Watch 2015 crab recommendations<sup>20</sup>

<b>Table A1: Adapted from Seafood Watch 2015 conservation ratings for blue crab and swimming crab</b>			
<b>Species/ Stock</b>	<b>Region</b>	<b>Gear</b>	<b>Overall</b>
Blue Crab	Chesapeake Bay	Trot Line	Best Choice
Blue Crab	Virginia	Crab Pot	Good Alternative
Blue Crab	South Atlantic	Crab Pot	Good Alternative
Blue Crab	Gulf of Mexico	Crab Pot	Good Alternative
Blue Crab	Delaware, Maryland, New Jersey	Crab Pot	Good Alternative
Blue Swimmer Crab	Indonesia	Bottom Trawl	Avoid
Blue Swimmer Crab	Thailand	Crab Pot	Avoid
Blue Swimmer Crab	Indonesia	Crab Pot	Avoid
Blue Swimmer Crab	Vietnam	Crab Pot	Avoid
Blue Swimmer Crab	Indonesia	Bottom Gillnet	Avoid
Blue Swimmer Crab	India	Bottom Gillnet	Avoid
Blue Swimmer Crab	Thailand	Bottom Gillnet	Avoid
Blue Swimmer Crab	India	Bottom Trawl	Avoid
Blue Swimmer Crab	Vietnam	Bottom Trawl	Avoid
Blue Swimmer Crab	Philippines	Many	Avoid
Red Swimmer Crab	China	Many	Avoid

### Appendix 3: Supplemental methods

Oceana staff submitted the crab samples to Applied Food Technologies, a commercial laboratory in Florida, for DNA testing to identify the species of crab present in each crab cake. The crab samples were obtained by choosing various sized crab lumps and meat from the crab cake and then dried and preserved with desiccant beads. Because there were media reports of chefs mixing both Maryland blue crab and foreign crab in their crab cake recipes,<sup>21</sup> the lab ran a special test (multiplex polymerase chain reaction) on our dried crab samples to monitor for the presence of more than one crab species in a sample crab cake.

The Food and Drug Administration (FDA) regulates seafood sold in interstate commerce. One of the tools used to guide labeling of seafood in the U.S. is the FDA Seafood List, which provides the acceptable market names, the common name and scientific name of over 1,800 species of seafood known or thought to be sold domestically.<sup>22</sup> The guidance of the FDA's Seafood List indicates only one species, *Callinectes sapidus*, may be marketed as "blue crab." The FDA lists nine species of swimming crabs besides the blue crab that also have paddle-shaped hind legs, all of which are marketed as "swimming crab."

### Appendix 4: An examination of U.S. imports of swimming crab

We examined the 2014 U.S. import data for swimming crab through the National Marine Fisheries Service database (NMFS).<sup>23</sup> Since 2000, the government groups all imported swimming crab together under the two groups, the *Callinectes* genus and the Portunidae family. Blue crab, and 28 other crab species that range mostly from the Atlantic Ocean and both coasts of the Americas,<sup>24</sup> belong to the *Callinectes* genus, while the Portunidae family includes all the swimming crab species that turned up in Oceana's testing (Table A2), including the *Portunus* and *Callinectes* genera and many others. Thus, the *Callinectes* group is a smaller subset of the Portunidae family. Appendix Figure A1 shows the data obtained for all swimming crab imports available through the U.S. government. This graph shows the U.S. is importing more than two times more *Callinectes* species, compared to the Portunidae species. Even more puzzling is that the U.S. appears to be importing these *Callinectes* species from Asian countries such as China, Indonesia, the Philippines, Vietnam and Thailand, places where these species do not originate. In fact, the countries representing the normal range of *Callinectes* species (Canada, Columbia, Ecuador, Mexico, Nicaragua and Venezuela), comprise only 10 percent of the total *Callinectes* imports. These same trends of large volumes of *Callinectes* originating from Asia appear in the U.S. import data since 2000.

Because of the disparity between where crabs are found in the water and from where they are imported, there is good reason to suspect the accuracy and veracity of the import data presented in Figure A2. We assessed whether it might be reasonable to assume that some *Callinectes* crabs may be exported to Asian countries for processing and then imported to the U.S. as products from those countries. To do so, we looked at the total *Callinectes* production from all of South and Central America and compared that to the total *Callinectes* imports to the U.S. from China, Indonesia and the Philippines, the top exporters of *Callinectes* to the U.S. for the year 2012. This was the most recent year for complete data on worldwide swimming crab production and U.S. imports.<sup>25,26</sup> We estimate that if all the *Callinectes* crabs caught in South and Central America were first sent to China, Indonesia and the Philippines for processing, this hypothetical Asian-processed *Callinectes* crab would still only account for one-quarter of the *Callinectes* imported to the U.S. from those Asian countries. In fact, from this assessment, it appears that the U.S. imports more *Callinectes* crab than is fished worldwide outside of the U.S. According to our examination of worldwide *Callinectes* production, U.S. import data and a crab expert we contacted to confirm, the U.S. government data shown in Figure A1 must be misreported.<sup>27</sup> We also contacted several crab importer/exporters who confirmed this conclusion. It is more likely that the *Callinectes* species listed as coming into the U.S. from Asian countries are really *Portunus* species from the Indo-Pacific region mislabeled as *Callinectes*.

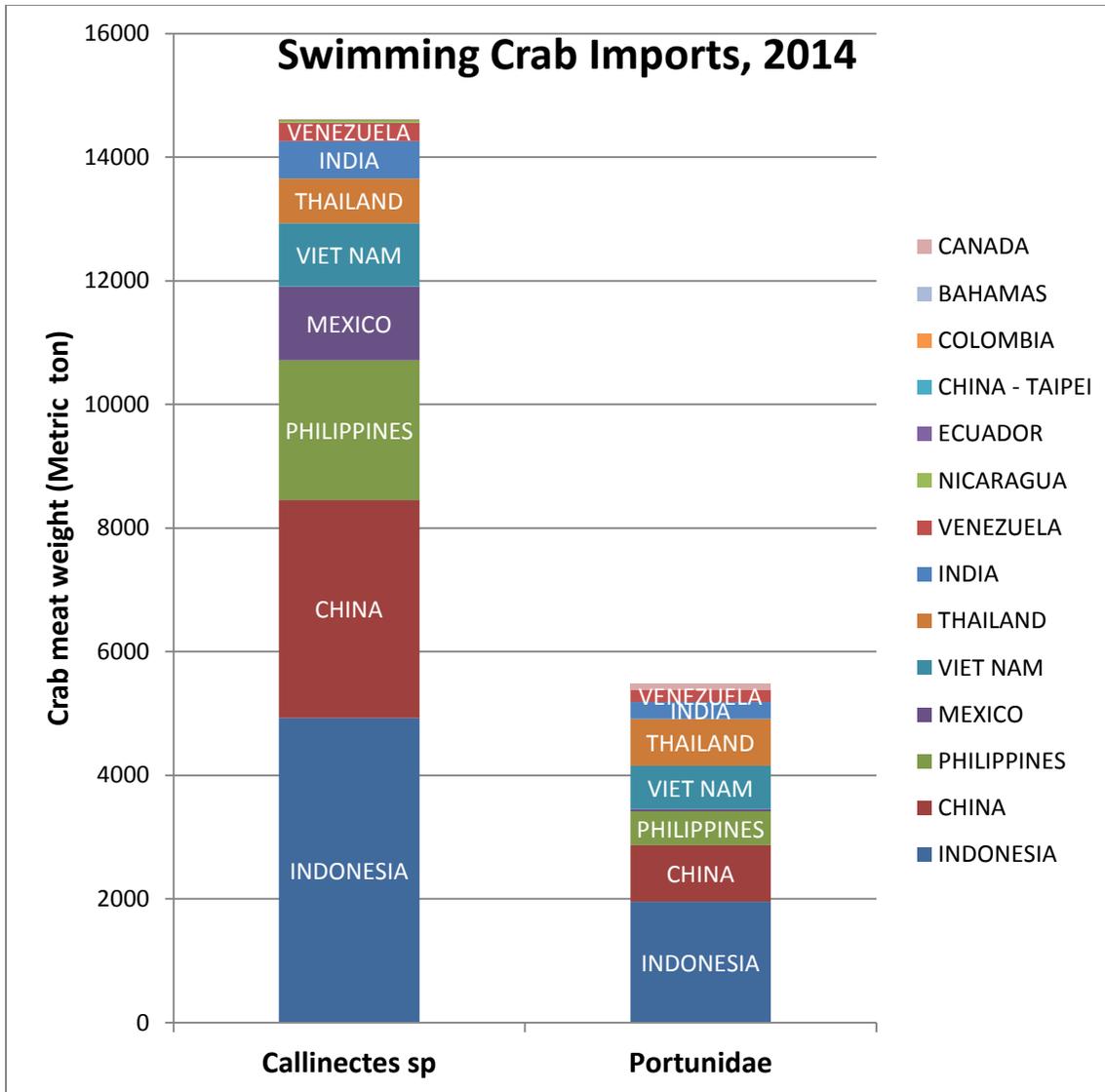


Figure A1. Official U.S. data on countries where the U.S. imported two groups of swimming crab in 2014. Note that these data are suspected to be untrustworthy by the report authors, as discussed in the text.

So, where does NMFS get these suspected mislabeled crab import data? The imported swimming crab was apparently mislabeled by the exporters filling out forms submitted to the U.S. Customs and Border Protection prior to import to the U.S. according to NMFS.<sup>28</sup>

#### Where does NMFS get this data?

Well, like everyone else, we purchase the data from the **Foreign Trade Division** of the U.S. Census Bureau. Census is responsible for compiling the information submitted by importers and exporters to the **U.S. Customs and Border Protection**. The data are normally **scheduled** for release to the public 43 days after the close of the statistical month.

Importers and exporters submit their transactions to the U.S. Bureau of Customs and Border Protection using the international Harmonized Commodity Description and Coding System (HS). The HS is the system for classifying goods in international trade which has been developed under the auspices of the **World Customs Organization (WCO)**, located in Brussels. The WCO is an

international organization consisting of representatives of about 161 countries. The U.S. is represented in the WCO by the U.S. Bureau of Customs and Border Protection. The **International Trade Commission** maintains the *Harmonized Tariff Schedule of the United States* used by importers to classify their goods. Exporters use the *Schedule B* maintained by the U.S. Census Bureau.

The Harmonized Tariff Codes used to fill out documents in the global trade of seafood are already faulted for their lack of specificity as to species traded and whether the seafood is farmed or wild.<sup>29</sup> For the likely erroneous crab data presented here, even providing correct genera-level data and country of origin are a challenge. Given these problems, it is easy to see why the mislabeling of seafood is such a global problem.<sup>30</sup> As a result, the true country of origin and species of swimming crab imported into the U.S. remains a mystery.

**Appendix 5: Species identified in Oceana’s crab cake testing**

<b>Appendix Table A2: Distribution and number of crab species identified</b>				
<b>Scientific Name</b>	<b>Common Name</b>	<b>FDA Market Name</b>	<b>Distribution</b>	<b>Number collected</b>
<i>Callinectes sapidus</i>	Blue crab	Blue crab	West Atlantic Ocean-Nova Scotia to Argentina	47
<i>Portunus pelagicus</i>	Blue swimming crab	Blue swimming crab	Indo-Pacific-Asia, Australia, East Africa	24
<i>Portunus pseudoargentatus</i>	no common name	not on FDA Seafood List	Indo-Pacific-Philippines, Japan, Australia	7
<i>Portunus sanguinolentus</i>	three spot swimming crab	swimming crab	Indo-Pacific-East Africa, Asia, Australia	2
<i>Portunus trituberculatus</i>	Gazami or horse crab	not on FDA Seafood List	Indo-Pacific-Southeast Asia, East Asia, Australia	2
<i>Portunus hannii</i> *	Warty or red swimming crab	swimming crab	Indo-Pacific-Southeast Asia, East Asia, Northern Australia	1
<i>Portunus spp.*</i>	(mixed species)		(Indo-Pacific)	3
<i>Callinectes bellicosus</i>	Cortez swimming crab	swimming crab	W. Pacific (W. Mexico)	2
<i>Charybdis sp.</i>		genus not on FDA Seafood List		2

\*These were suspected or determined to be mixed with other *Portunus* species contained in a single crab cake.

## Endnotes

- <sup>1</sup> Maryland Manual On-line. Accessed 3/20/15 at <http://msa.maryland.gov/msa/mdmanual/01glance/html/seafoodp.html>
- <sup>2</sup> National Oceanic and Atmospheric Administration (NOAA) Chesapeake Bay Office. Blue Crab. Accessed 3/23/15 at <http://chesapeakebay.noaa.gov/fish-facts/blue-crab>
- <sup>3</sup> Finchman, M. W., 2012. 35 Years of Blue Crab Research. Chesapeake Quarterly, Vol. 11. Accessed 3/20/15 at <http://www.chesapeakequarterly.net/V11N2/intro/>
- <sup>4</sup> Chesapeake Bay Foundation Report. 2010. The economic argument for cleaning up the Bay and its rivers. Accessed 3/23/15 at <http://pawatersheds.org/wp-content/uploads/2011/05/CBF-Report-Value-of-Water-Quality-Nov-2010.pdf>
- <sup>5</sup> E.G., Sidman, J. "Maryland Crab Fakes" Washington City Paper. 6/ 13/2012
- <sup>6</sup> Rentz, Z. Crabmeat imports flood into Baltimore, Baltimore Sun 12.13.14
- <sup>7</sup> Cascorbi, A. Seafood Report: Crabs Volume 1. Monterey Bay Aquarium (MBA) Seafood Guide. (Accessed March 16, 2015). [http://www.seachoice.org/wp-content/uploads/2011/11/MBA\\_SeafoodWatch\\_BlueCrabReport.pdf](http://www.seachoice.org/wp-content/uploads/2011/11/MBA_SeafoodWatch_BlueCrabReport.pdf)
- <sup>8</sup> Finchman, M. W., 2012. 35 Years of Blue Crab Research. Chesapeake Quarterly, Vol. 11. Accessed 3/20/15 at <http://www.chesapeakequarterly.net/V11N2/intro/>
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- <sup>10</sup> Warner, K., Timme, W., Lowell, B., and Hirshfield, M. 2013. Oceana Study Reveals Seafood Fraud Nationwide: Oceana. Accessed March 23, 2015 at <http://usa.oceana.org/reports/oceana-study-reveals-seafood-fraud-nationwide>
- <sup>11</sup> Warner, K., Golden, R., Lowell, B., Savitz, J. and Hirshfield, M. 2014. Shrimp: Oceana Uncovers Widespread Misrepresentation of America's Favorite Seafood. Oceana. Accessed 3/23/15 at <http://usa.oceana.org/news-media/publications/reports/shrimpfraud>
- <sup>12</sup> 2014 Chesapeake Bay Blue Crab Advisory Report; Chesapeake Bay Stock Assessment Committee.
- <sup>13</sup> U.S. Food and Drug Administration (FDA). 2015. The Seafood List: The FDA's Guide to Acceptable Market Names for Seafood Sold in Interstate Commerce. Accessed 3/23/15 at <http://www.accessdata.fda.gov/scripts/fdcc/?set=seafoodlist>
- <sup>14</sup> See notes 10 and 11
- <sup>15</sup> Sanchez, S. Taste Test: Crabmeat. Washington Post. 7/3/12.
- <sup>16</sup> Rentz, C. Seafood fraud cases plummet as NOAA cuts investigators. Baltimore Sun 12/6/14
- <sup>17</sup> E.g. See FDA wholesale seafood labeling investigation. Accessed 3/23/15 at <http://www.fda.gov/Food/GuidanceRegulation/GuidanceDocumentsRegulatoryInformation/Seafood/ucm419982.htm>
- <sup>18</sup> NOAA Office of Science and Technology. National Marine Fisheries Service (NMFS), Commercial Fisheries Statistics. Commercial Landings. Accessed February 27, 2015 from <http://www.st.nmfs.noaa.gov/commercial-fisheries/commercial-landings/index>
- <sup>19</sup> (S. Vilnit, Pers. Com)
- <sup>20</sup> Monterey Bay Aquarium Seafood Watch. Accessed 3/23/15 at <http://www.seafoodwatch.org/>
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- <sup>22</sup> FDA Seafood List. (March, 2015)
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- <sup>26</sup> NMFS Commercial Fisheries Statistics (2011).
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<sup>30</sup>Golden, RE and Warner, K. 2014. The Global reach of Seafood Fraud: a Current Review of the Literature. Oceana. Accessed March 23, 2015 from [http://usa.oceana.org/sites/default/files/seafood\\_fraud\\_map\\_white\\_paper\\_new.pdf](http://usa.oceana.org/sites/default/files/seafood_fraud_map_white_paper_new.pdf)