

the David & Lucile Packard FOUNDATION



# Progress Toward Sustainable Seafood – By the Numbers 2017 Edition

California Environmental Associates

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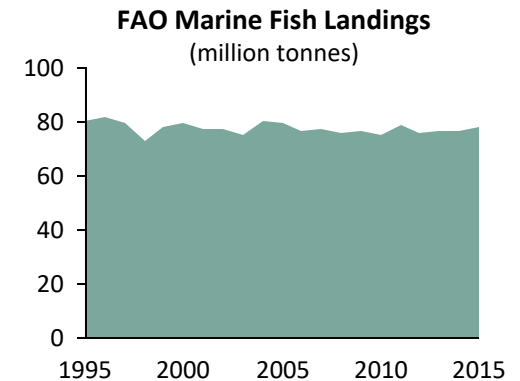
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# Executive Summary: The State of Global Oceans

**Global landings continue to stagnate or decline in fisheries around the world,** as fishing effort has quadrupled over the past four decades. These two developments combined have led to massive declines in fishery productivity.

**Depending on the source, total catch estimates vary significantly.** FAO, which tracks only reported landings, provides lower global catch estimates than sources like Sea Around Us Project (SAUP) and a new database compiled by Reg A. Watson, which attempt to reconstruct missing catch data from IUU, discards, and artisanal fisheries.

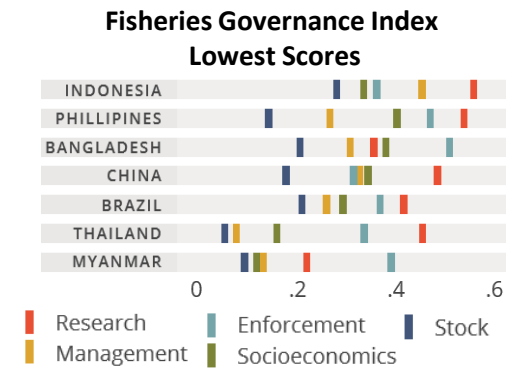
**Estimates of overall stock health also range widely from worrisome to bleak.** FAO’s SOFIA report, the most optimistic source we reviewed, estimates 31% of global stocks are overfished; SAUP puts the figure at 40%. A recent paper by Costello et. al found a majority of global fisheries have biomass below MSY.



*FAO’s global marine fish landings have stagnated or declined since the early 1990s. Sources with reconstructed catch and discards maintain this overall trend.*

**Widespread degradation also presents a great opportunity, especially for countries with the least-effective management:** a shift to more sustainable management can yield massive growth in profit, food, and biomass. Countries like Thailand, Brazil, and China would contribute most to global gains.

**However, the countries with the greatest potential upside from reform have also been most challenging to engage.** These countries often have low capacity to implement better fisheries management and have a large portion of artisanal fisheries that are difficult to engage through traditional market-based interventions like certification, ratings, and improvement projects.



*In each area, countries are rated from 0 (low) to 1 (high) in terms of effectiveness.*

# Executive Summary: Production, Consumption, and Trade

**Seafood consumption is rapidly increasing, fueled by growth in aquaculture production.** In 2014, aquaculture produced more food for human consumption than capture fisheries. Capture production is still twice as large when reduction species are included, but increases in aquaculture will close this gap by 2030.

**International seafood trade has grown alongside consumption: with 37% of volume traded, it is among the world’s most-traded commodities.** This signals the potential strength of the market conservation movement, but it is important to consider that a large portion of trade occurs between partners with good fisheries management – especially among European nations – and a growing portion among markets with relatively low demand for sustainable seafood.

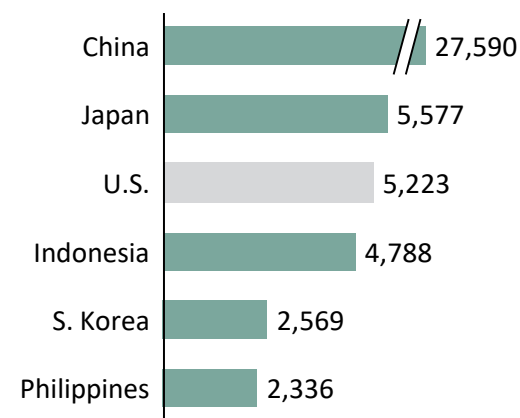
Seafood Trade by Value, 2015  
(billion USD)



**Asia is the most dynamic fisheries region in the world; it has been and will continue to be a driver of growth in production, consumption, and trade.** Asia has 5 of the top 6 seafood-consuming nations, and many have among the fastest growing per capita consumption rates in the world. China alone consumes more seafood than the next 9 countries combined and accounts for 18% of global capture and over 60% of global aquaculture production of fish.

**While fisheries in many Asian nations are considered to be in need of reform, a shift to Western-style management would likely decrease productivity.** Asian fisheries have relied on speciation, the removal of predator species, to drive increased production of smaller species. Reverting to single-species management would likely increase biomass, but reduce total catch and value.

Top Seafood Consuming Nations, 2013  
(million tonnes)

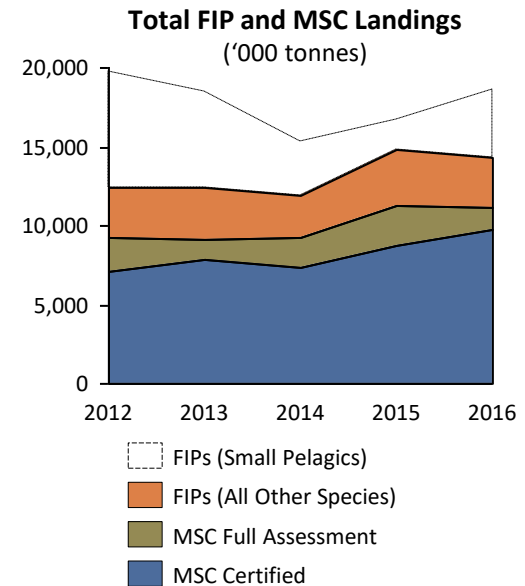


# Executive Summary: Certification and Social Issues

**Total landings engaged by FIPs and MSC have increased by 2.4 million tonnes since 2014, excluding small pelagic FIPs.** By including small pelagics FIPs (and the newly reengaged Peruvian anchoveta FIP), the figure grows to 3.2 million tonnes.

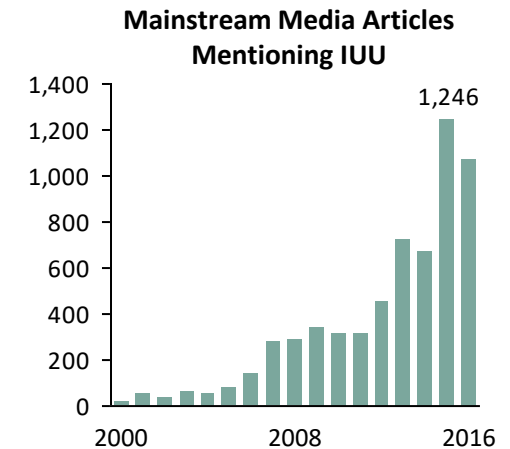
**Certification schemes are disseminating rapidly: FIPs and MSC certifications marked a decade of steady growth, and GAA and ASC aquaculture certifications have skyrocketed.** Since 2014, fisheries engaged by FIPs grew by 12% and MSC by 32%, while ASC certifications quadrupled and GAA certifications doubled.

**In 2016, the launch of FisheryProgress.org heralded a new, consolidated source for reliable information on FIPs.** At the time of publishing, the site contained information on 52 FIPs in 22 countries from 22 different implementers. It's registered user base had grown to over 450, including 150 industry members.



**Since 2014, media coverage of IUU and social issues in the seafood supply chain has increased tremendously.** This is true in both mainstream coverage, such as the New York Times' Outlaw Ocean series, and industry outlets, including IntraFish.com. The increased interest is mirrored in consumer search trends.

**The Sustainable Seafood Movement has also expanded its reach into social issues and IUU.** FairTrade Seafood has successfully launched and several FIPs have begun to include social considerations in their improvement objectives. With regard to IUU, the past two years have seen widespread adoption of the Port State Measures Agreement and an increased emphasis on traceability work, including NGO partnerships and new technology development.



# Overview of Seafood Metrics Project

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## PURPOSE

- Continue consistent tracking effort to monitor the impact of sustainable seafood initiatives on the global seafood market
- Update and build upon previous reports (2008, 2010, 2013, 2015)
- Aggregate and provide all readily available data on sustainable seafood efforts and impacts to the conservation community
- Inform long-term adjustments to strategy and other market-based approaches to addressing environmental issues

## METHODOLOGY

- Simple, quantitative, and replicable
- Included a survey of conservation community to update existing datasets as well as identify and baseline new relevant datasets
- Conducted a scan of relevant, publicly available data

## LIMITATIONS

- Limited time series data
- Difficult to attribute direct cause-and-effect relationships given the market orientation of grantee tools
- Quality, timeliness, and availability of data

# Overview of Seafood Metrics Report

METRICS INCLUDED

Global status and trends in fishery health and exploitation

**GOAL: IMPACT ON THE WATER**

Fishery improvement projects  
Certification data

**PRODUCER-LEVEL PROGRESS**  
Individual producers have the capacity and support from the NGO and corporate communities to improve.

**POLICY CHANGE**  
A combination of advocacy and corporate support help drive improved government regulations and enforcement.

Policy timeline  
Port State Measures  
Marine Protected Areas  
E.U. policy update  
U.S. policy update

Global seafood consumption  
Seafood trade flow data  
Key commodity trade flow trends

**CONSUMPTION & TRADE DYNAMICS**  
Demand generated by sustainable seafood commitments is transmitted through international trade and the ability to engage fisheries is a function of the market's global reach. Unlike the other categories, trade dynamics is not generally considered an area of NGO focus.

Corporate-NGO partnerships  
Greenpeace's scorecard data

**BUSINESS RELATIONSHIPS & SUPPLY CHAIN ENGAGEMENT**  
Influential businesses operationalize their commitments to sustainable seafood.

Media and literature penetration  
Industry event attendance  
U.S. seafood consumption  
Consumer interest and preferences  
Enabling businesses and initiatives

**CONDITIONS FOR BUSINESS CHANGE**  
Influential businesses have the information, tools, and motivation to engage on sustainable seafood, based partly on consumer awareness and NGO partnerships.

# Impact on the water

METRICS INCLUDED

Global status and trends in fishery health and exploitation

**GOAL: IMPACT ON THE WATER**

## Key takeaways

- Global catch levels have continued to be flat or declining. There is inconsistency in catch reconstructions due to discrepancies in reported bycatch and IUU fishing.
- Approximately 30% of global stocks are overfished, and that number has slowly increased in recent years.
- Regionally, fisheries vary in their biomass levels and fishing mortality rates, the greatest recent improvements have occurred in Northeast Pacific fisheries.
- Countries with the lowest capacity for good fisheries governance stand to gain the most from increased investment, including improvements to overall stock health and increased profits from better management.
- Improvements in the number of overfished stocks in the U.S. have leveled off after years of progress following MSA, whereas in the E.U.'s Mediterranean and Black Seas, stock health continues to decline.
- Total aquaculture production (including plants) exceeded total wild-capture production in 2013, and in 2014 aquaculture produced more fish for human consumption than wild capture. This growth is projected to continue, and by 2030 total fish production from aquaculture (for human and non-human use) is expected to equal capture production.



# The state of global fisheries appears to vary depending on information source

**Roughly 30-40% of wild stocks are overfished, although research shows world catch is significantly underreported and might not accurately portray discarded bycatch and IUU fishing.** Global wild-fisheries-related databases produce different assessments, as they vary in their methods of estimating both global catch and the health of stocks. Catch reconstructions suggest much is still unknown about fisheries globally.

**FAO**  
 The U.N. Food and Agriculture Organization (FAO) provides multiple resources related to the state of fisheries: the SOFIA annual fisheries report, the FIRMS database, and the FishStat database. The SOFIA report uses a combination of assessed stocks and expert judgment to estimate the state of fisheries.

**Pauly et al.**  
 Pauly et al. estimate global catch trajectories that differ considerably from, and are much higher than, what FAO data suggests.

**Watson**  
 Watson estimates global catch trajectories by harmonizing landings data from a range of public sources. Findings include large-scale fishing, small-scale fishing, IUU fishing, and discards, and are slightly higher than the Sea Around Us Project.

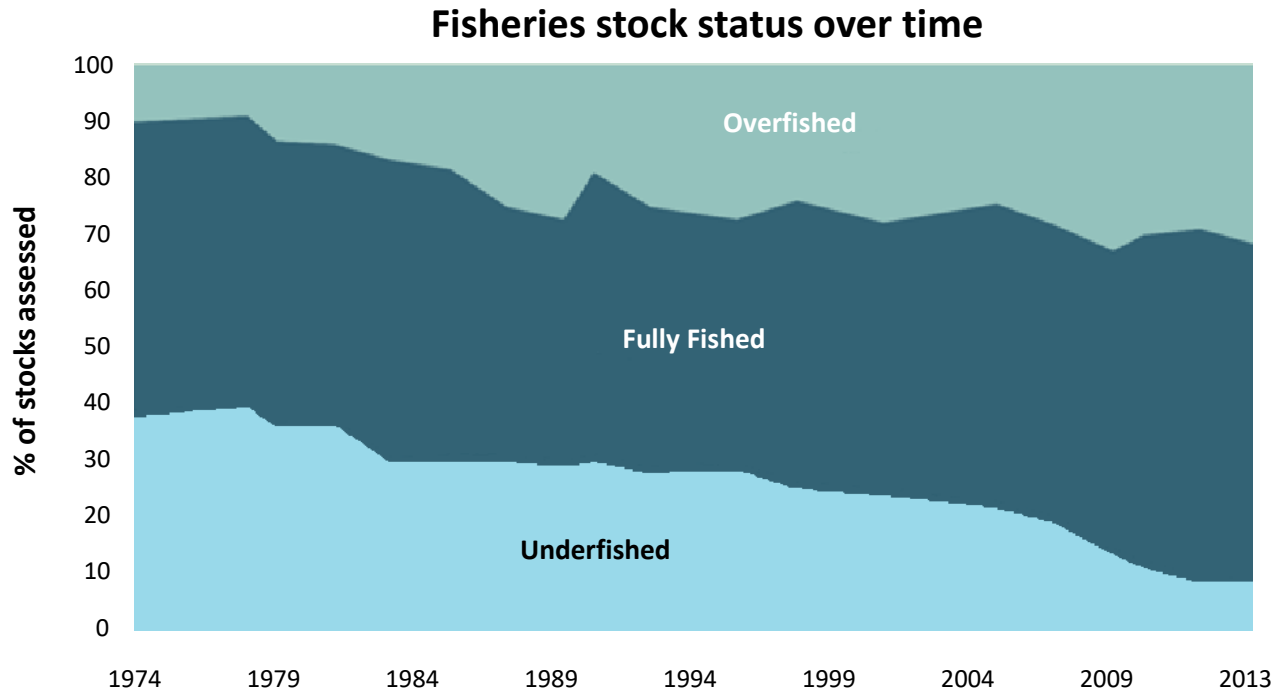
**RAM Legacy Database**  
 Covers assessed stocks in considerable detail, but has limited geographic coverage (e.g., poor coverage of South America, China), and no estimate of unassessed stocks

**Costello et al.**  
 Costello et al. estimate the current fishery status of both assessed and a portion of unassessed stocks using a model based on RAM Legacy Stock Assessment and FAO marine captures database.



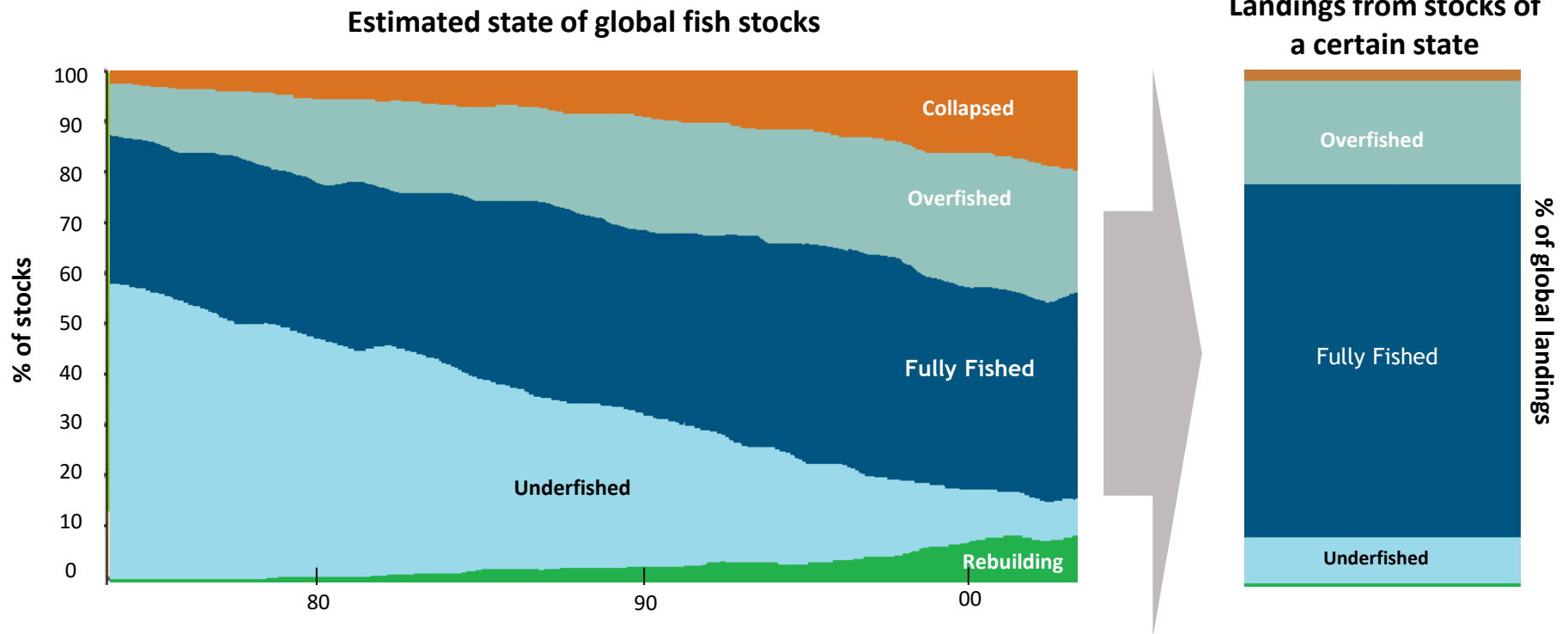
# The State of World Fisheries and Aquaculture (SOFIA): 31% of stocks are overfished; this has remained relatively stable for the past five years

The FAO SOFIA report suggests that overfishing has increased, then stabilized over recent years, based on stock assessments and expert judgment on many of the stocks that lack formal assessments.



# Sea Around Us: 40% of stocks may be overfished or collapsed, and they contribute most to global landings

**Pauly et al. estimate that 40% of stocks are overexploited or collapsed,** using catch history to estimate the status of both assessed and unassessed stocks globally.

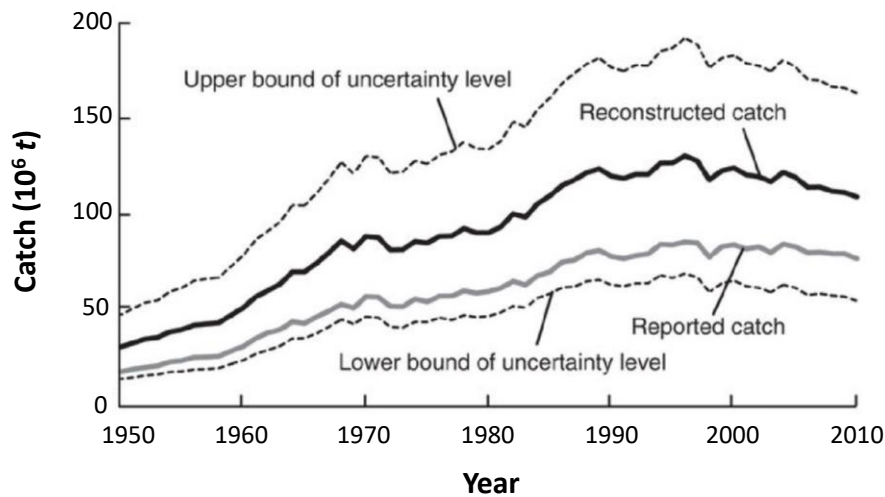


The available data stretches only to the mid 2000s, but at that time there were early signs that global stock statuses might be beginning to improve.

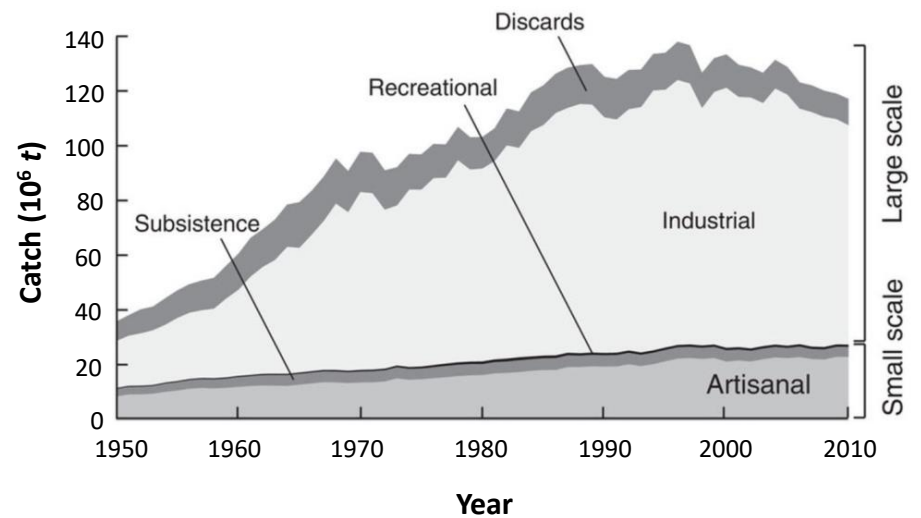
# Sea Around Us: Global catch reconstructions are 53% higher than total catch data reported by FAO

**Pauly et al. determined that catch trajectories, based on global catch reconstructions, differ considerably from the national data submitted to the FAO.** FAO landings, which do not include discards, suggest that world catch peaked in 1996 at 86 million tonnes before declining. The reconstructed catch, which did estimate a time-series for discards, peaked in 1996 at 130 million tonnes, and began to decline more dramatically. The findings suggests the need for improved monitoring of all fisheries, including illegal fishing and discarded bycatch.

**Trajectories of Reported and Reconstructed Marine Fisheries Catches, 1950-2010**



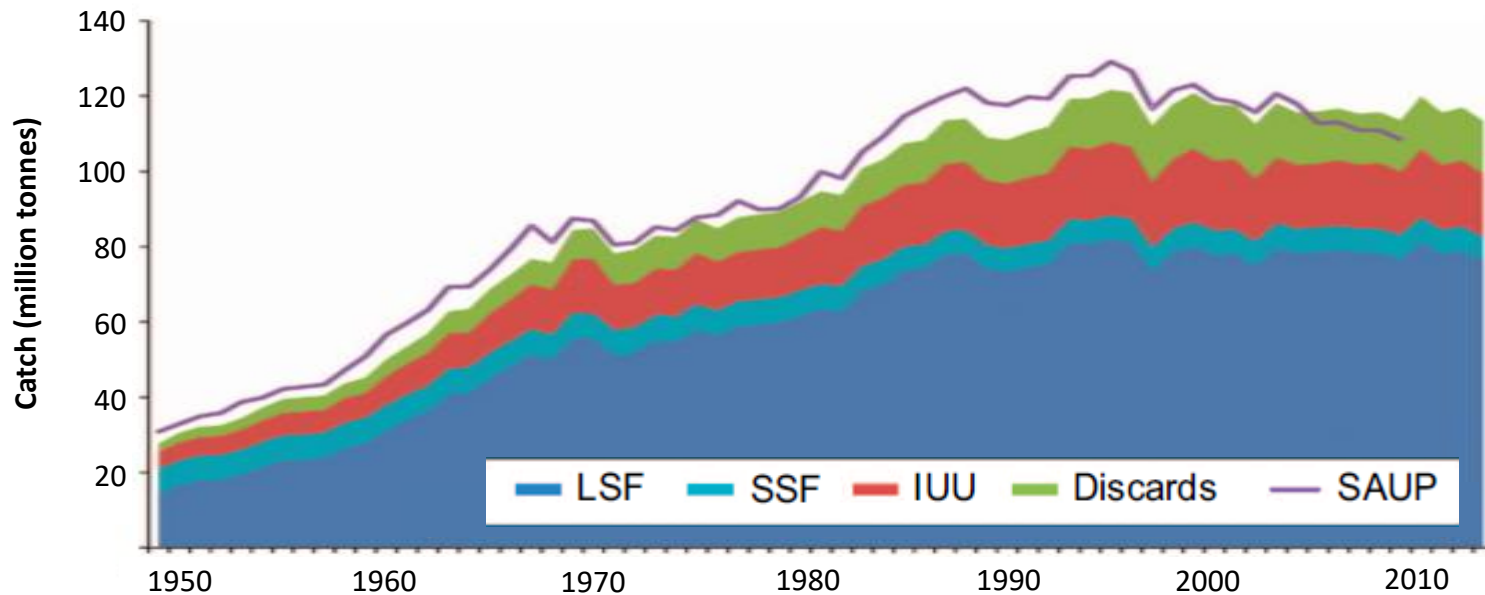
**Reconstructed Global Catch by Fisheries Sectors**



# A new fisheries landings database also shows higher catch reconstructions than catch reported by FAO, due to discarded bycatch and IUU fishing

**Watson created a harmonized global fisheries database using data from a range of public sources to show similar global catch reconstructions to the Sea Around Us Project (SAUP), though Watson’s estimates exceed SAUP in recent years.** Like SAUP, the reported catch reconstructions are much higher than FAO, as they include estimates of discarded catch and IUU fish. The methodology differs from Pauly et al. in that it combines publicly available data sources (including SAUP), whereas SAUP combines FAO reported data with new estimates of unreported catches based on other data available data (such as number of vessels, or fuel consumed locally).

Total tonnage and breakdown of catch from 1950 to 2014

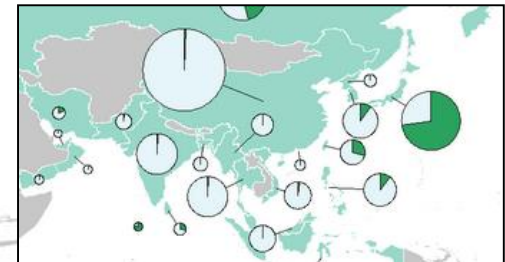


*LSF is large-scale fishing; SSF is small-scale fishing; IUU is illegal and unreported fishing; Discards are rates of discard at sea; and SAUP provides a comparison with the global total for on-line country catch reconstructions by SAUP.*

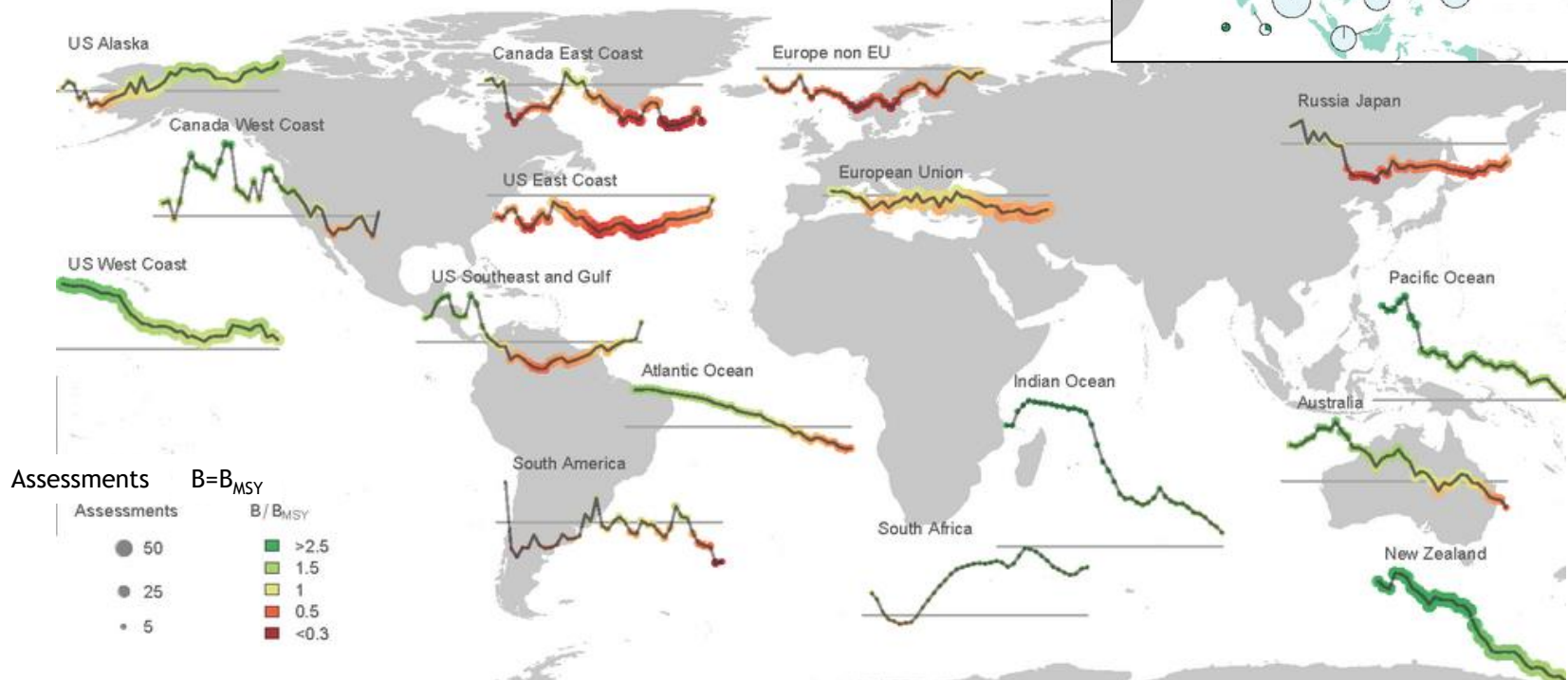
# RAM Legacy: Trends vary in different parts of the world; fisheries in North America and Europe appear to be doing better than in the rest of the world

**In the United States, Europe, and South Africa some assessed fisheries have either stabilized or recovered while some still remain below optimal biomass. Elsewhere, stocks appear to be generally declining.**

**% of catch covered by RAM Legacy**



**Fisheries stock biomass**

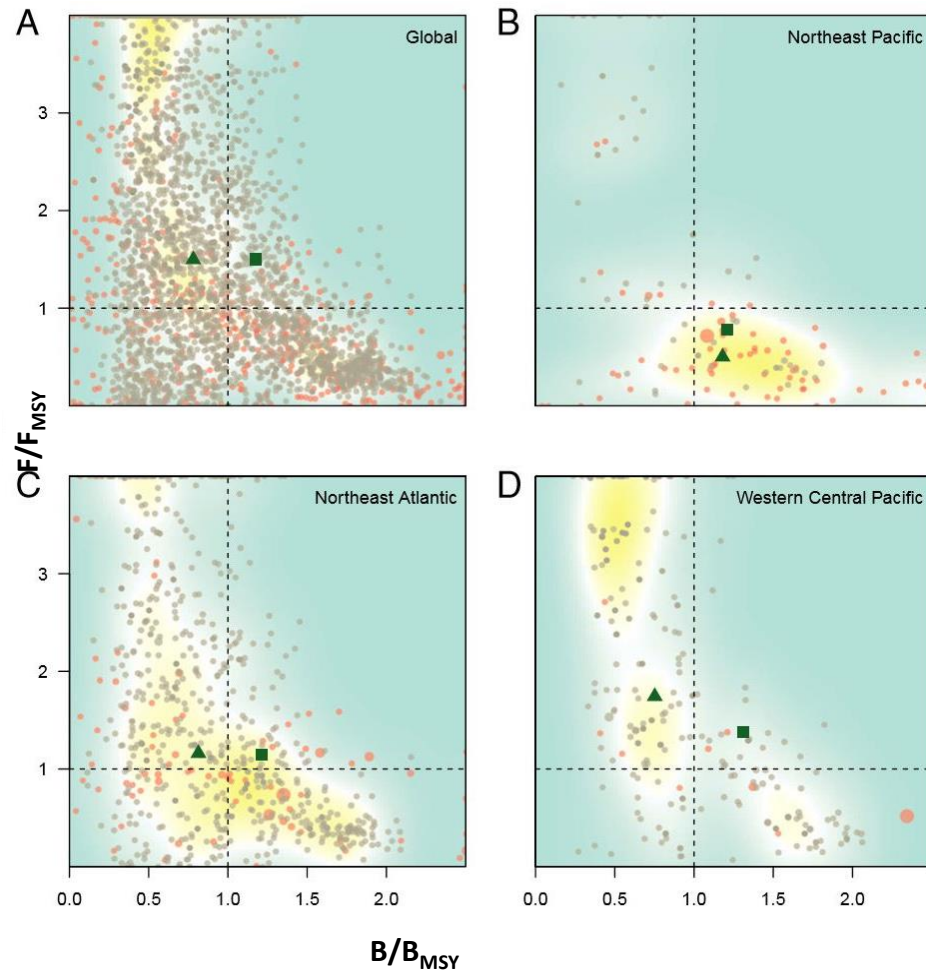


Color and vertical position represents the proportion of the stocks in the region that are overfished. Thickness of lines is proportional to how many stocks are contained in the data base.

The majority of global fish stocks have biomass below  $B_{MSY}$ , but catch-weighted average biomass is above  $B_{MSY}$  in all regions due to high-volume, fecund fisheries

**Globally, fish stocks have a wide variety of biomass levels (B) and fishing mortality rates (F), and progress toward sustainable fishery management varies regionally, with most recent progress occurring in Northeast Pacific fisheries.**

- In the Northeast Pacific, a great many fisheries are doing well and getting better, with biomass levels generally above maximum sustainable yield ( $B/B_{MSY} > 1$ ) and fishing mortality pressure below maximum sustainable yield ( $F/F_{MSY} < 1$ ).
- In the Northeast Atlantic, stock health varies, but as a whole the region is doing relatively well. Many fisheries in the region are on track to improve with mortality pressure below MSY.
- In the Western Central Pacific, fisheries are generally in poor condition, with a large concentration of overfished stocks that are currently subject to overfishing as well.
- Highly fecund, high-volume fisheries, like tuna and small pelagic species, pull the catch-weighted average stock health in all regions above  $B_{MSY}$  (green square).



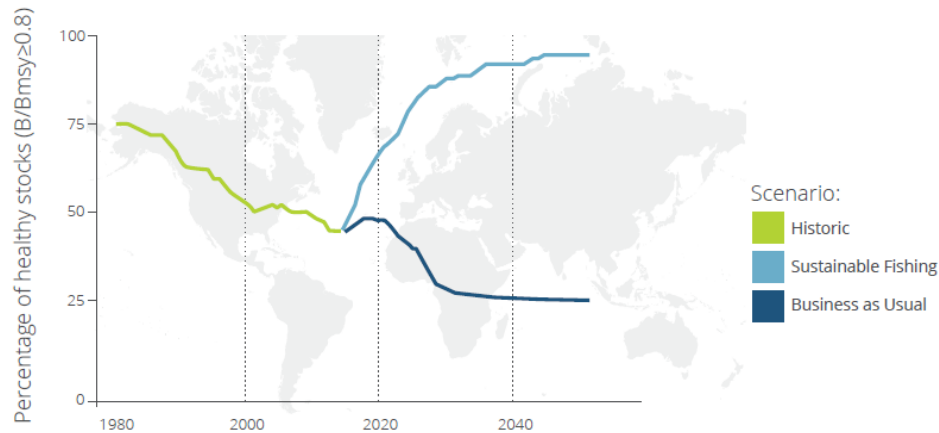
Current fishery status (“Kobe”) plots for four illustrative regions. Each dot represents a fishery. The red dots represent data from the RAM database, and the black dots represent estimates for unassessed fisheries. Dot size scales to fishery catch. Shading is from a kernel density plot. The green triangle is the median and the green square is catch-weighted mean for the given region. Panels represent data from (A) all global fisheries in the Costello et al. database, (B) Northeast Pacific, (C) Northeast Atlantic, and (D) Western Central Pacific regions.

## IMPACT ON THE WATER

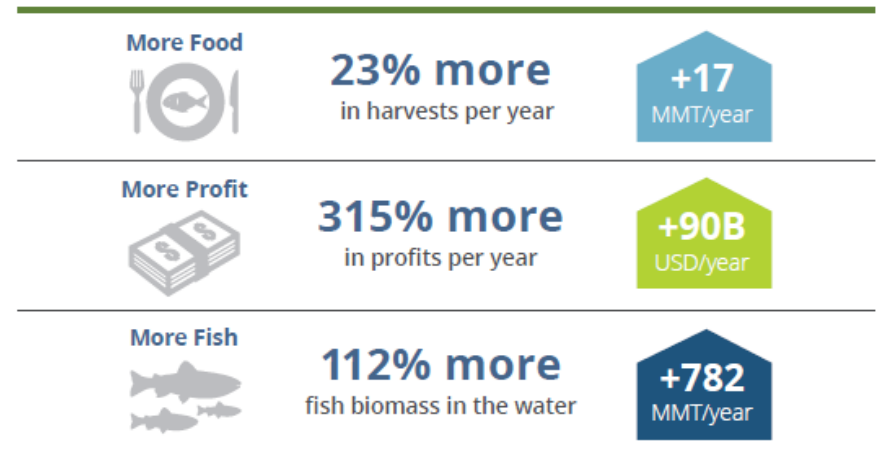
Fisheries possess tremendous potential for improvements that generate both economic and environmental gain

**Improved sustainable fisheries management could increase economic prosperity, food security, and biodiversity conservation.** Half of assessed ocean fisheries are underperforming in terms of economic value, food production, employment, and fish biomass. The Ocean Prosperity Roadmap found that if sustainably managed in the long term, the fishing sector could increase profits by 90 billion USD, food production by 17 MMT, and fish biomass in the ocean by 112%.

### Global stock health under sustainable fishing vs. BAU scenarios



### The Ocean's Tremendous Potential



Relative to BAU

*This analysis, based on stocks representing 77% of global catch, suggests that in 10 years global fish production could increase by 14% even as the amount of fish left in the water for conservation grows by 36%. Over the long term, profits could increase more than threefold (90 billion USD). This is true for all fishing nations, though increases would be larger in some than in others.*

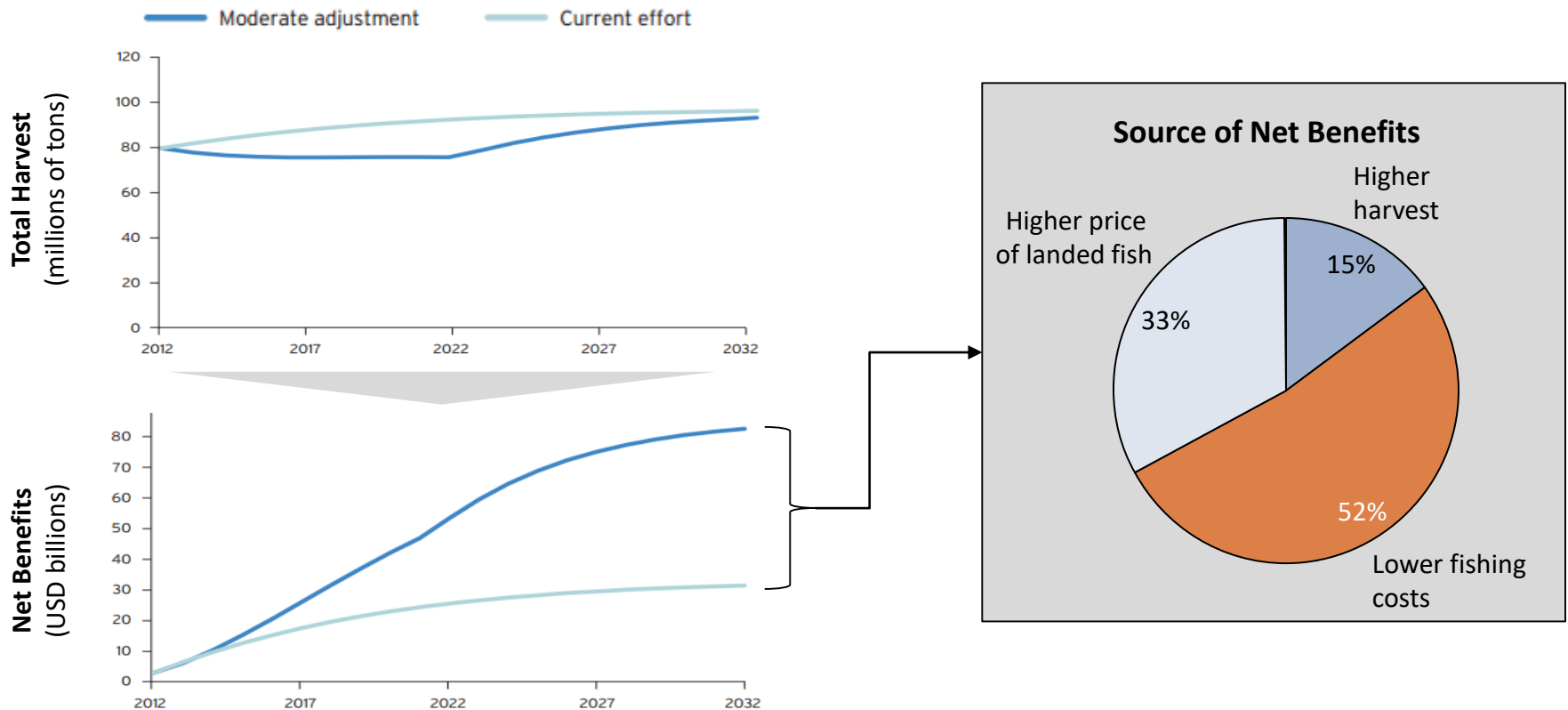


## IMPACT ON THE WATER

Mismanagement of fisheries created economic losses of \$83 billion in 2012 alone. With sustainable management, the sector could recoup these losses

**The moderate\* path to recovering annual losses of \$83 billion involves sustained reduction of global fishing effort, allowing stocks to recover to sustainable and productive levels.** However, economic gains would be driven by savings resulting from the reduced fishing effort needed to achieve the same harvest level after stocks recover. As a result, the transition costs would be born primarily by displaced fishers and vessel owners.

**Moderate\* Path to Sustainable Fisheries**



\*The moderate path is designed so that, starting from the observed 2012 level, the global fishing effort is gradually reduced at the annual rate of 5 percent from 2013 onward, until the long-run optimal level is attained.

Source: World Bank, "The Sunken Billions Revisited: Progress and Challenges in Global Marine Fisheries," 2017,

<http://tinyurl.com/kyf4rsg>.

## IMPACT ON THE WATER

# Science-based harvest limits and monetary investments into fisheries are the keys to successful fisheries management

**Three management attributes related to strong, science-based limits are the largest determining factors for whether a country's stocks are improving:**

- 1) Extensiveness of stock assessments
- 2) Strength of fishing-pressure limits
- 3) Comprehensiveness of enforcement programs

**Monetary investment and the design of incentives play important roles in achieving these objectives.**

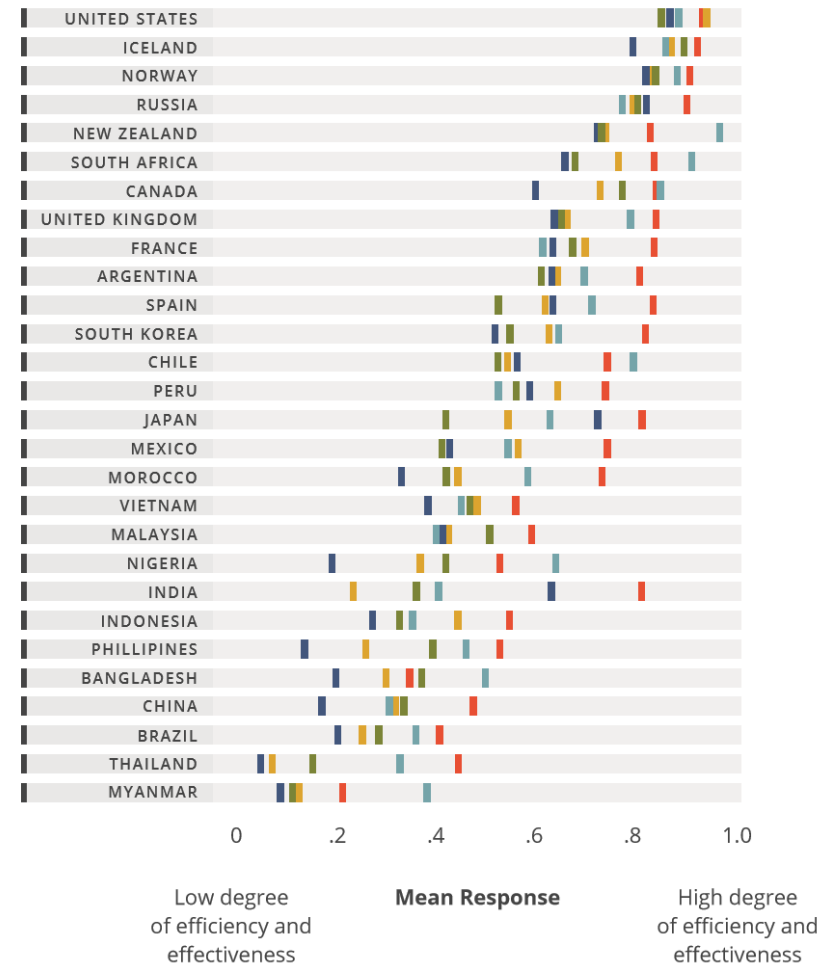
Fisheries Governance Index scores showed strong positive correlation with GDP per capita and negative correlation with capacity-enhancing subsidies.

**Countries with less-effective management systems have the greatest potential to improve long-term stock status.** The countries with the lowest scores, including Myanmar, Thailand, Brazil, and China, should be focal points of efforts to improve management globally.

*Summarized survey answers by dimension and country. Responses are weighted by both respondent expertise and confidence in individual answers provided, and are adjusted for observed differences among respondent background categories. Countries (n = 28) are sorted by Fisheries Management Index values, a composite of Research, Management, Enforcement, and Socioeconomics dimensions.*



### Fisheries governance index

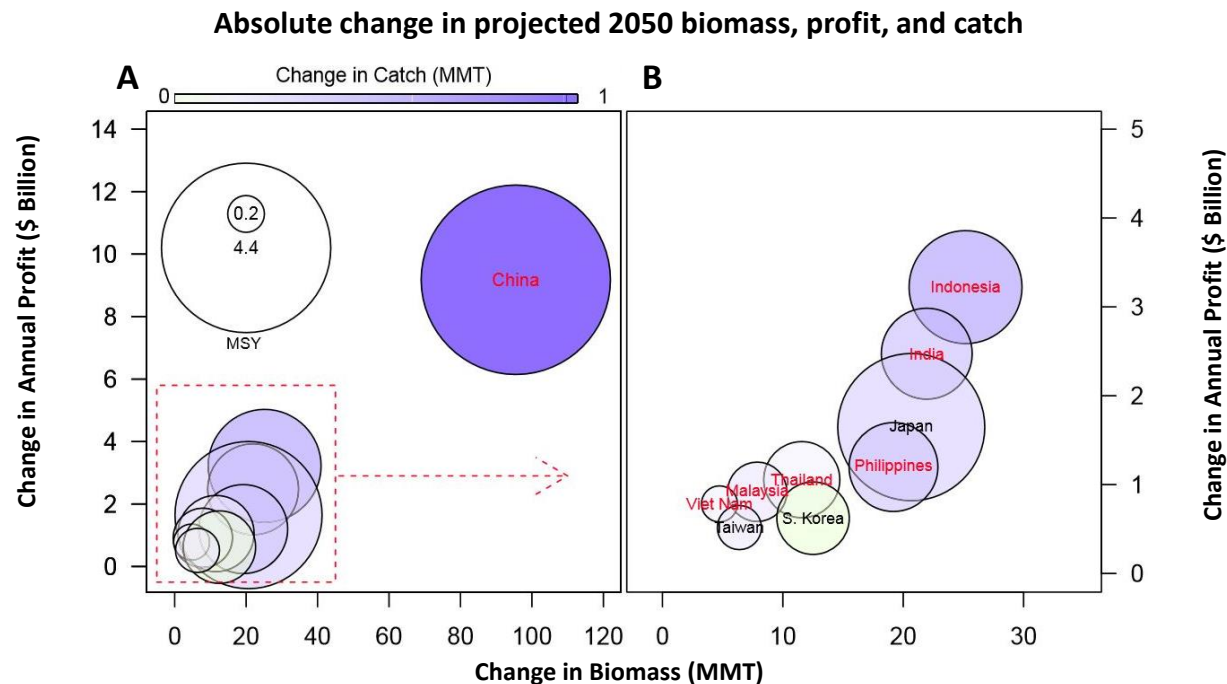


## IMPACT ON THE WATER

Countries that currently have low capacity for fisheries management have the greatest potential to increase profitability and improve labor practices

**Countries with poor fisheries governance have the most potential to increase their fisheries' profitability.**

Fisheries are common pool resources, with stock health highly correlated with good fisheries governance. Countries with poor fisheries governance currently spend significantly less on management, but have the greatest potential to increase fisheries' profitability with improvements in fisheries governance.



Circle size indicates the maximum sustainable yield (in million metric tons) for stocks of conservation concern in the country. Country names in red indicate more than 50% of increased profits come from fisheries in the FAO category "not elsewhere included."

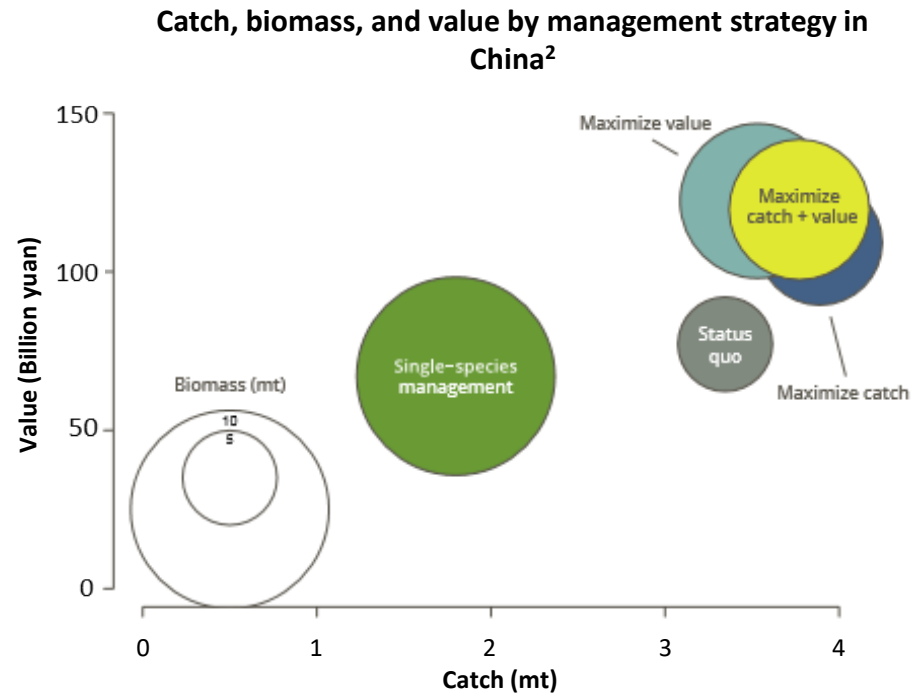
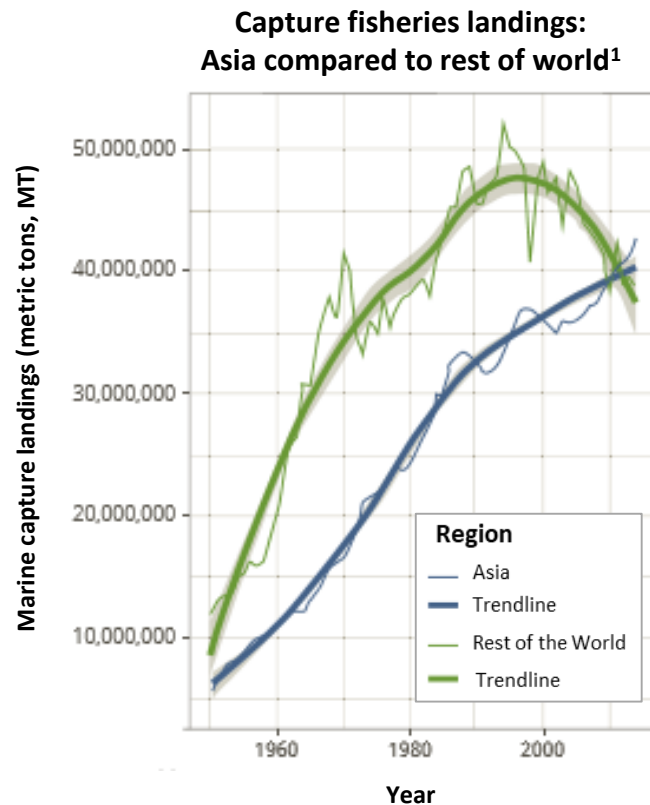
[Panel A] The 10 countries that could experience the greatest increase in profit under economically optimal harvest strategy compared to BAU (China, Indonesia, India, Japan, Philippines, Thailand, Malaysia, Republic of Korea, Vietnam, and Taiwan).

[Panel B] Expanded view of 9 clustered countries in the bottom left.

## IMPACT ON THE WATER

Asian fisheries landings continue to grow as the rest of the world's landings decline; speciation is likely driving these production gains

**Speciation, the removal of large predatory fish, is likely contributing to the sustained productivity of Asian fisheries.** As larger predatory fish are removed, ocean biomass may actually increase due to higher production of smaller fish. Single-species management is the dominant fisheries management strategy in North America and Europe to optimize catch. Though reverting to single-species management in China would increase biomass by 109% compared to the status quo, it would lead to decreases in catch (-46%) and value (-13%), since the food web has been condensed through predatory removal.



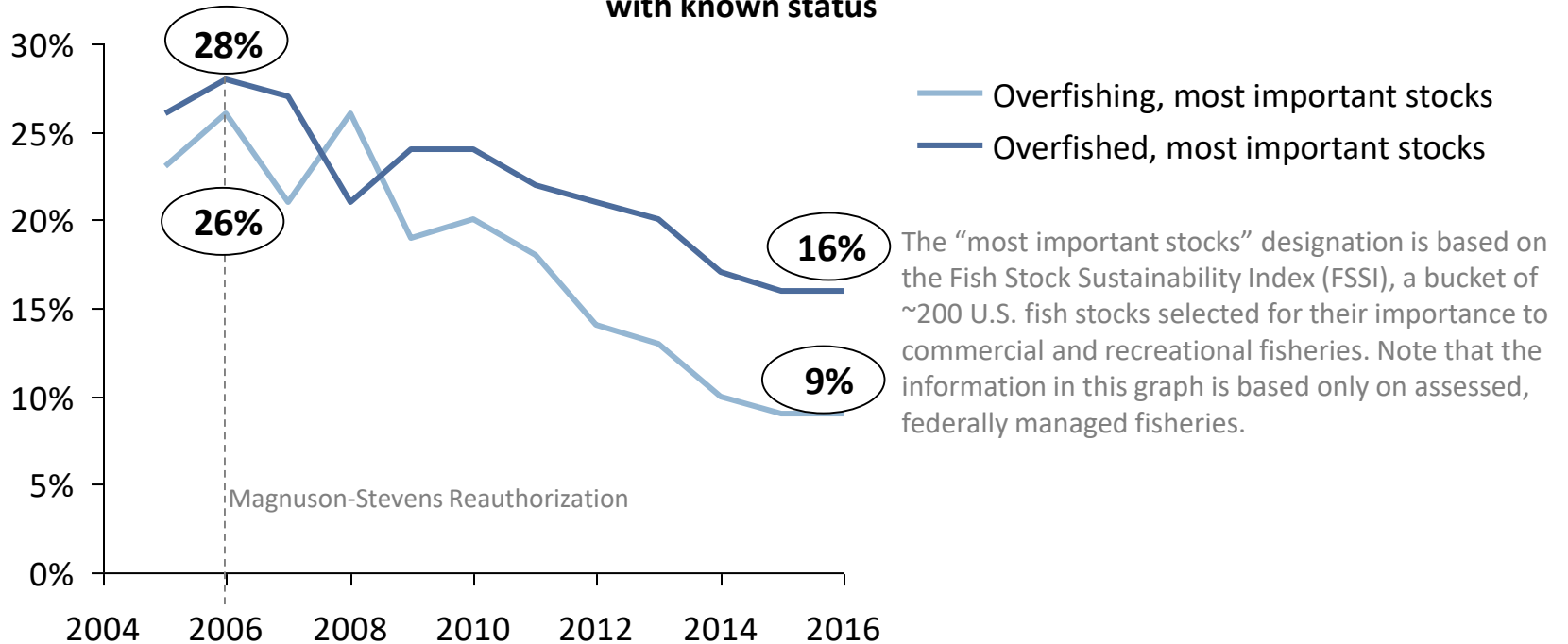
*Ecosystem-wide catch (x axis), biomass (circle size), and value (y axis) by management strategies. Bar plot at the Top displays the selectivity by strategy, color-coded to match the circles representing scenarios within the main figure.*

## IMPACT ON THE WATER

# The United States has made significant progress reducing overfishing in federally managed fisheries since the Magnuson-Stevens Act reauthorization

**The number of U.S. fisheries experiencing overfishing has decreased by more than half since the 2006 reauthorization of the Magnuson-Stevens Act and subsequent amendments.** Of the most important federally managed stocks, 9% are subject to overfishing,\* down from 26% in 2006. Additionally, only 16% are overfished,\* down from 28%. Positive progress is threatened, however, based on NOAA’s final rewrite of the National Standard 1 (NS1) Guidelines in 2016. This rule permits risky management decisions that may leave stocks levels, fish populations, and fishing communities vulnerable.

**Percentage of fisheries that are overfished or subject to overfishing in the United States, of stocks with known status**



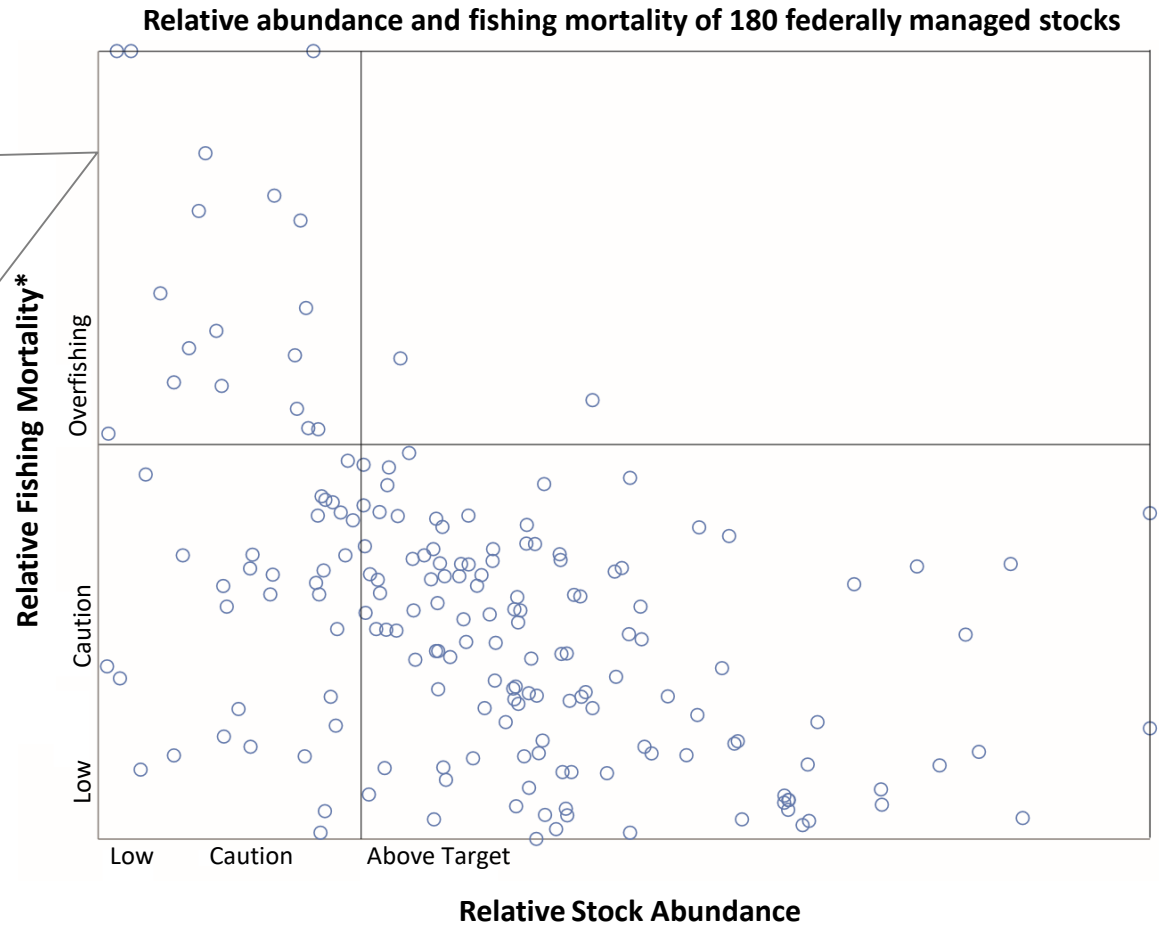
\*“Overfished” refers to the state of the stock (i.e., biomass), while “overfishing” refers to whether catch is occurring at a sustainable level (i.e., fishing pressure/mortality).

## IMPACT ON THE WATER

The majority of federally managed stocks are well managed and are in good health, though exceptions exist (e.g., bluefin tuna, Atlantic cod, red snapper)

Examples of stocks that are overfished and experience overfishing in the United States as of 2016 include:

- Blue king crab – Pribilof Islands
- Pacific bluefin tuna – Pacific\*
- Striped marlin – Western and Central Pacific\*
- Atlantic cod – Georges Bank, Gulf of Maine
- Witch flounder
- Yellowtail flounder – Cape Cod/Gulf of Maine, Georges Bank, S. New England/Mid-Atlantic
- Winter flounder – Georges Bank
- Blacknose shark – Atlantic
- Blue marlin – Atlantic\*
- Dusky shark – Atlantic
- White marlin – Atlantic\*
- Scalloped hammerhead - Atlantic
- Hogfish - Southeast Florida
- Red snapper



\*"Relative fishing mortality" is based on current fishing mortality rates and fishing mortality limits from NOAA stock assessment and management data.

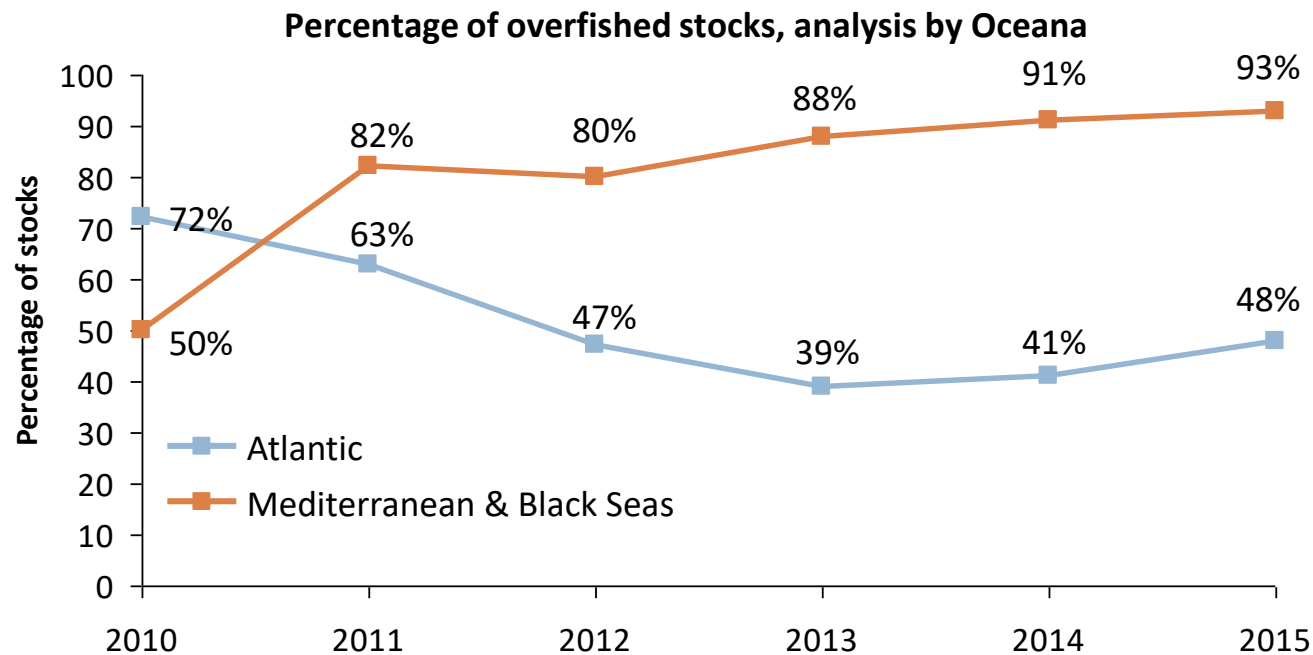
\* Stock is fished by U.S. and international fleets.

Source: NOAA, "Prioritizing Fish Stock Assessments," 2015; NOAA, "Status of the Stocks," 2016.

## IMPACT ON THE WATER

# Europe—a tale of two seas: stocks in the North Atlantic improved over the last decade, while Mediterranean and Black Seas stocks continue to be overfished

- The percentage of overfished stocks in the North Atlantic has decreased from 94% in 2004 to 48% in 2015, with marginal increases since 2013.** It is too early to tell if this uptick is the start of a new trend. Biomass in the North Atlantic is on average 73% of the level that can produce maximum sustainable yield (MSY), with the highest percentage of sustainably exploited stocks in the Barents Sea and Norwegian Sea.<sup>1</sup>
- The Mediterranean and Black Seas remain poorly assessed and overfished.** The number of stocks fished beyond safe biological limits remains high: 14 in 2012; 17 in 2013 and 2014; and 16 in 2015. In most ecoregions of the Mediterranean and Black Seas, biomass is on average 44% of the level that can produce MSY, and fewer than 20% of the stocks are exploited sustainably.<sup>1</sup>

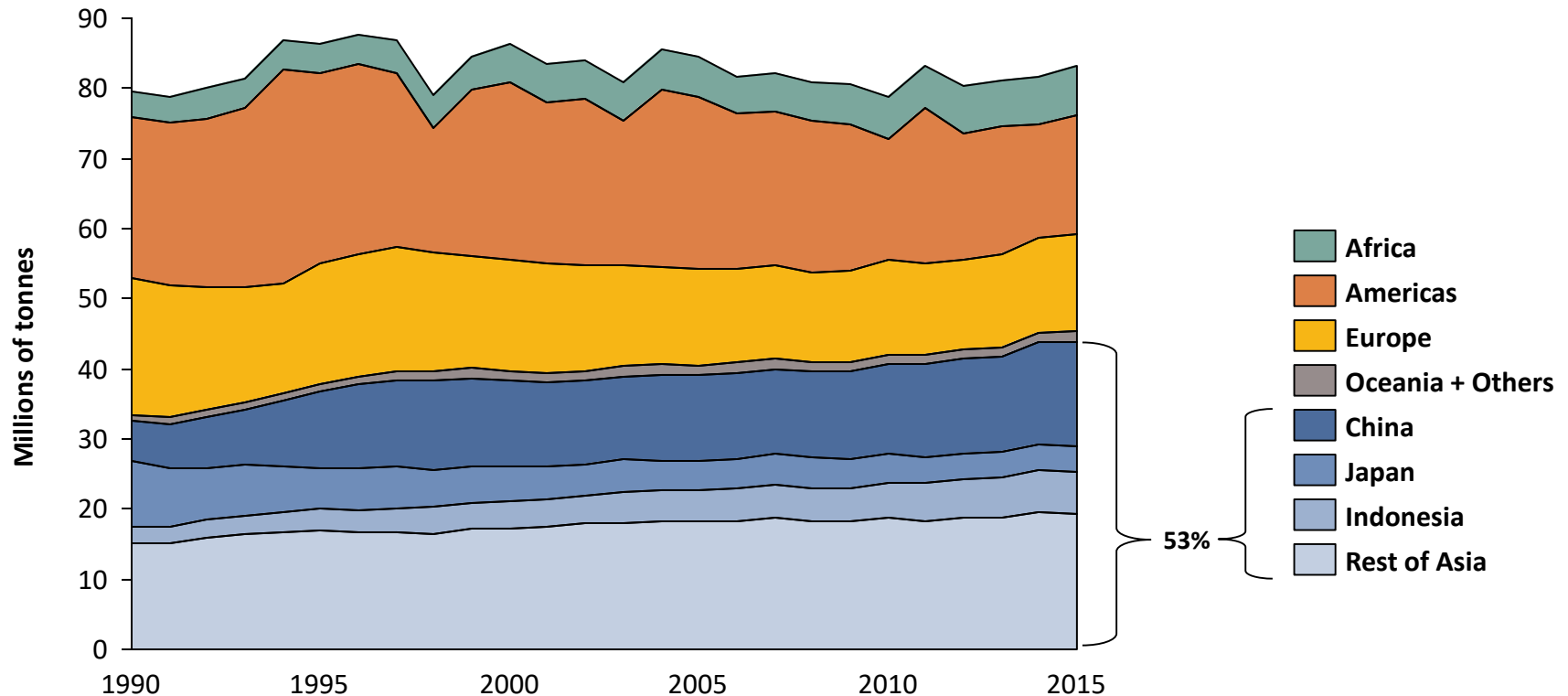


1. Stock assessments are presented for 397 stocks in 14 European ecoregions, from the Barents Sea to the Black Sea. Source: Oceana, "Exploitation and Status of European Stocks," 2016, <http://tinyurl.com/lvb6989>; "Oceana Fishing Opportunities Recommendations for 2016 North East Atlantic Stocks," <https://tinyurl.com/k4dy85s>.

# Asia accounted for 53% of global wild-caught production in 2015; China alone accounted for 18%

**Asia accounts for the majority of wild-caught marine seafood globally, led by Chinese production.** Though current catch levels in many parts of Asia may be unsustainable, per capita fish consumption in the region is expected to increase, and fishing industries will continue to grow.<sup>1</sup>

Wild-caught seafood production by continent, 1990-2015<sup>2</sup>



Sources:  
 1. FAO, SOFIA, 2016  
 2. FishStatJ (Freshwater landings and seaweed harvest not included)

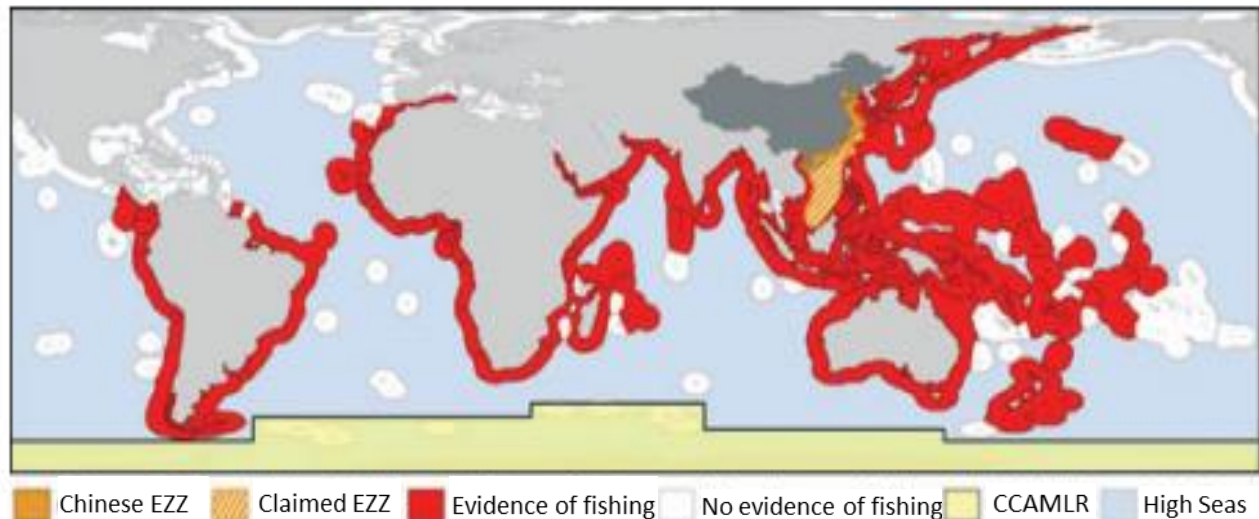


## IMPACT ON THE WATER

China's distant water fleet is large and will maintain its global reach despite a small recent effort by the government to reduce its size

**China's 13<sup>th</sup> Five Year Plan (2016-2020) states that it will simultaneously develop high seas fishing capacity and strictly control the intensity of fishing.**<sup>1</sup> In early 2017, the Chinese Ministry of Agriculture sought to address overfishing by announcing reductions of medium- and large-sized vessels by 8,300 and total fishing vessels by 20,000. However, these represent reductions of only 13% of the distant water fleet and less than 3% of the total fleet, and subsidies that led to significant expansion of the fleet from 2008 to 2012 have remained in place.<sup>2</sup>

**Exclusive Economic Zones (EEZ) of countries or territories where Chinese vessels were reported to operate (2000-2011)<sup>3</sup>**



*Information based on more than 500 reports documented in the Online Supporting Materials. Note the very large size of China's claimed EEZ, which is the cause of disputes with Japan, South Korea, Taiwan and all South-East Asian countries bordering the South China Sea, that is, Brunei Darussalam, Indonesia, Malaysia, the Philippines and Vietnam.*

Sources:

1. <https://tinyurl.com/k6ha7u5>

2. <https://tinyurl.com/md6qjzn>

3. Pauly et al., "China's distant-water fisheries in the 21st century," 2013.

## IMPACT ON THE WATER

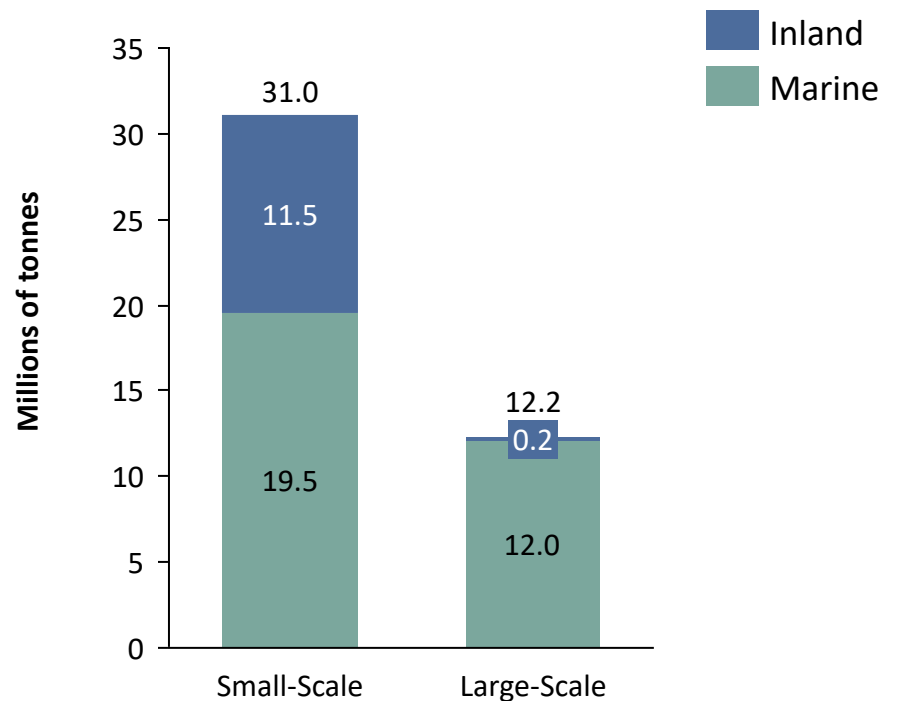
# Sustainable market based initiatives have made relatively few inroads into improving the sustainability of small-scale fisheries

**Small-scale fisheries, which account for almost half of global fish catch by volume and value, as well as 90% of capture fishery jobs, has seen slow progress in improving sustainability.** Small-scale fisheries also represent 80% of the global fish catch by volume and 71% by value in the developing world.<sup>1</sup> Only a small number of MSC certified fisheries are small-scale, including Ashtamudi estuary short-necked clam and Suriname Atlantic seabob shrimp.

### Small-scale fisheries facts

- Small-scale fisheries employ more than 10 times as many people as large-scale fisheries in developing countries<sup>2</sup>
- Small-scale fisheries land roughly 25-40% of the world's total catch<sup>2</sup>
- Over 90% of small-scale fisheries catch is consumed within the country of origin<sup>1</sup>
- Small-scale fisheries contribute roughly 2/3rds of marine fisheries landings destined for human consumption in developing countries<sup>1</sup>

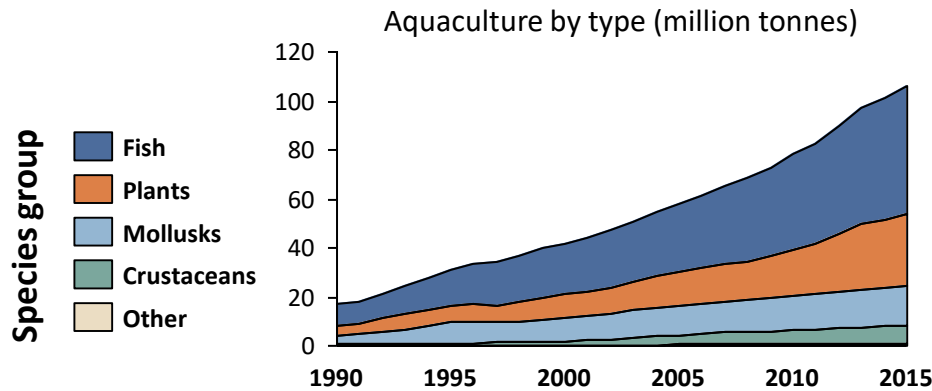
### Volume of developing country fisheries catch destined for direct human consumption in 2008<sup>1</sup>



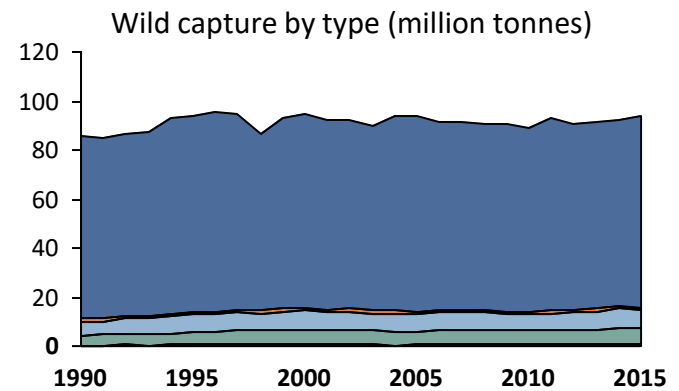
# Total aquaculture production has continued to grow, outpacing total capture production and shifting the global seafood landscape

**In 2013, total aquaculture production (fish and plants) surpassed capture production for the first time, as capture landings have remained flat. In addition, 2014 was the first year that aquaculture provided more fish for human consumption than did capture fisheries.**

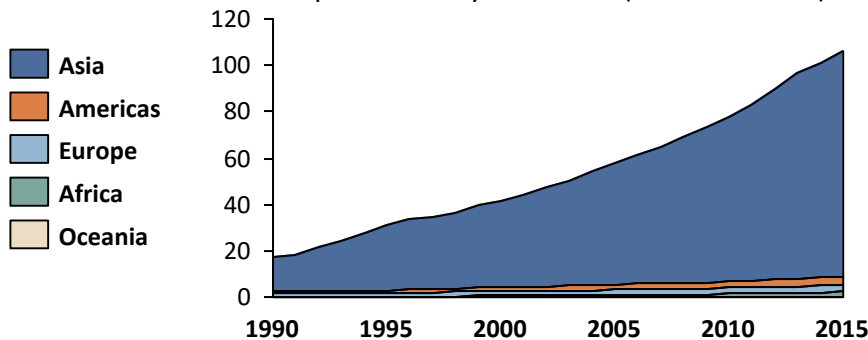
**Global aquaculture output**



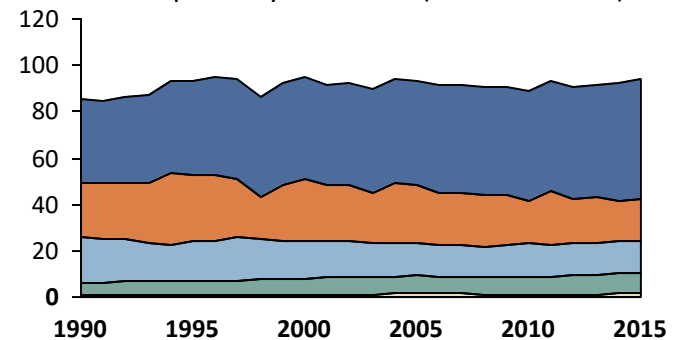
**Global wild-capture output**



**Aquaculture by continent (million tonnes)**



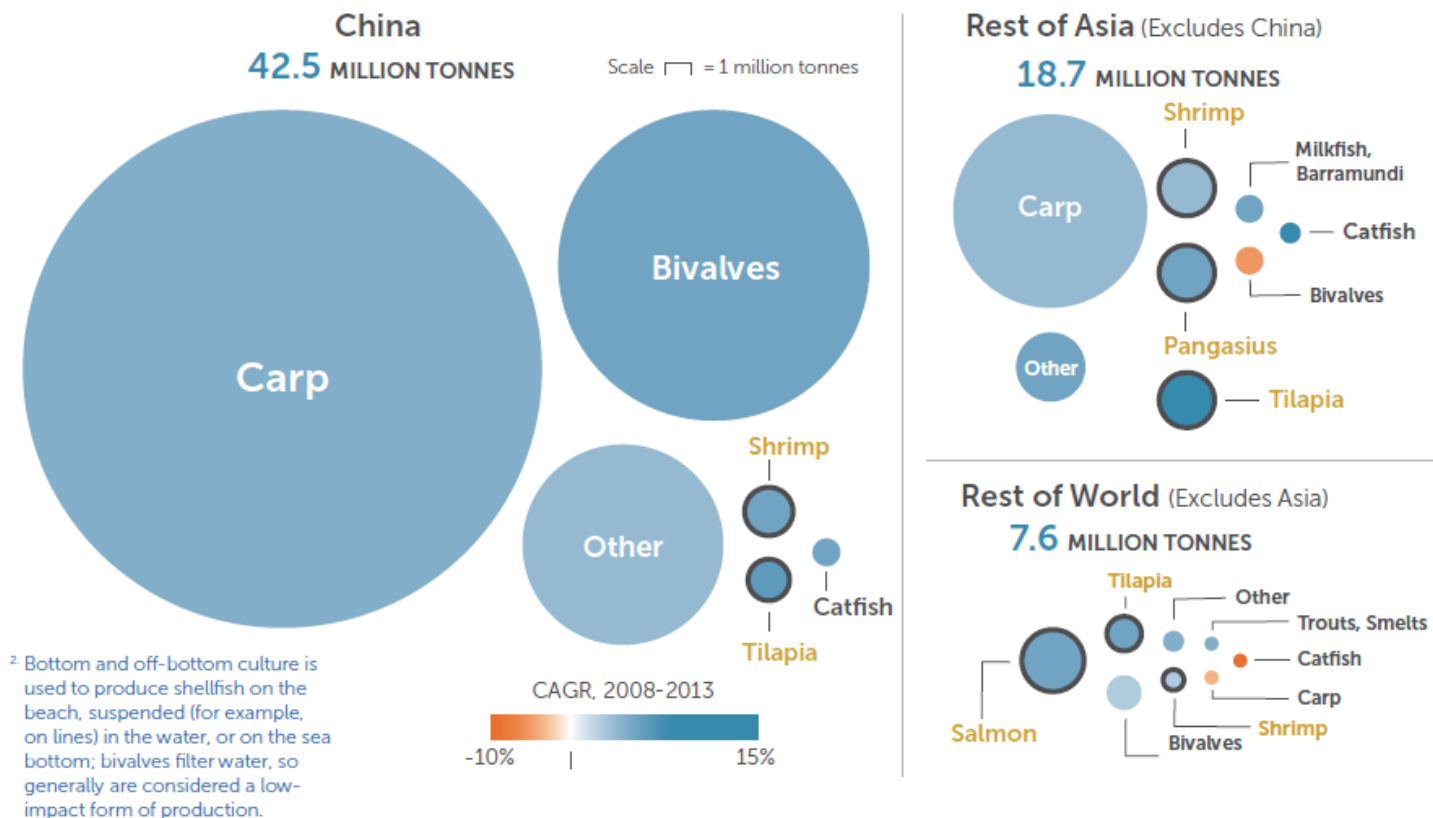
**Wild capture by continent (million tonnes)**



## IMPACT ON THE WATER

Carp and other freshwater species, primarily grown in Asia, represent the vast majority of aquaculture fish produced globally

**Excluding seaweed, China is far and away the world's leading aquaculture producer**, and the rest of Asia accounts for the majority of non-Chinese production. Carp, catfish, and tilapia likely will represent 60% of total fish production from aquaculture by 2025. In 2014, fish harvested from aquaculture had an estimated first-sale value of US \$160.2 billion.



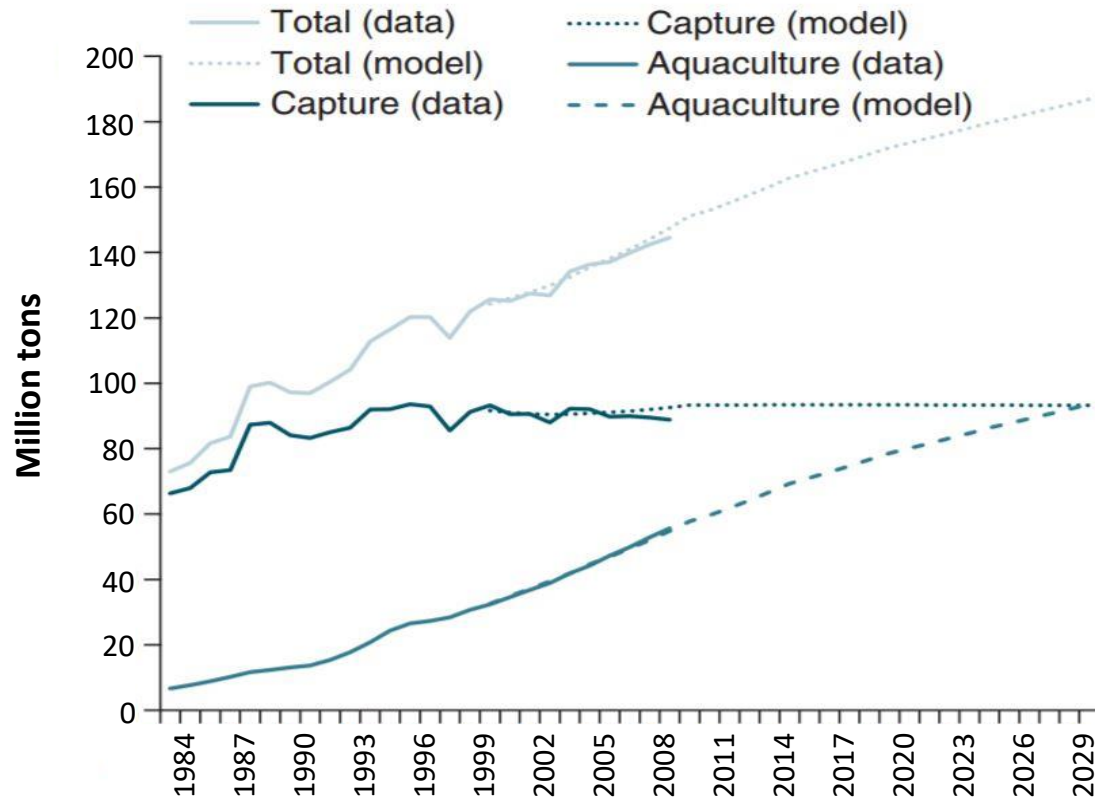
Note: Black borders and green text indicate highly traded commodities exported primarily to markets with strong sustainable and responsible seafood commitments.

## IMPACT ON THE WATER

The World Bank estimated that total fish production from aquaculture will equal wild fish landings by 2030

**The World Bank predicts that global fish production from aquaculture will continue to rise over the next decade while capture production will remain fairly stable.** In 2011, global capture totaled 90.4 million tons, compared with 63.6 million tons of fish produced through aquaculture. By 2030, the Bank predicts that fish production from capture and aquaculture will be roughly equal at approximately 93 million tons each.

**Projected global fish supply, 1984-2030**



# Producer-level progress

METRICS INCLUDED

Global status and trends in fishery health and exploitation

GOAL: IMPACT ON THE WATER

Fishery Improvement Projects

Certification data

**PRODUCER-LEVEL PROGRESS**  
 Individual producers have the capacity and support from the NGO and corporate communities to improve.

Policy timeline  
 Port State Measures  
 Marine Protected Areas  
 E.U. policy update  
 Policy update

Global s  
 Sea  
 Key commod  
 Corpora  
 Greenp  
 Media and li  
 Indust  
 U.S. s  
 Consumer inte  
 Enabling busi

### Key takeaways

- The number of MSC-certified fisheries continues to increase, and MSC-certified volume accounted for 12% of global marine catch in 2016.
- The total number of active FIPs has increased by 12% since 2014, though FIP landings have remained relatively constant. Increases in volume, partly driven by a new Peruvian anchovy FIP, have been offset by other FIPs either stalling or transitioning to MSC certification.
- Other certification schemes, such as Friend of the Sea and IFFO, are less prominent, but have continued to grow and remain significant.
- GAA and ASC certifications have increased rapidly over the past two years, with growth in certifications outpacing global growth in aquaculture production; however, certified product still accounts for less than 5% total production.
- Social concerns within the seafood supply chain have risen to prominence following high-profile media coverage leading to new efforts to improve social conditions, including the first FairTrade certified fisheries which provide premiums for fisherman and workers.

PRODUCER-LEVEL PROGRESS

Market-based interventions influence nearly 25% of wild-caught seafood globally; tuna, molluscs, and whitefish are the most engaged commodities

Total landings volume from FIPs and the MSC Program by species group

Seafood Category	# of All FIP Fisheries <sup>1,2</sup> 269		# of MSC Full Assessment UoC 59		# of MSC Certified UoC 294		# of All FIP & MSC Fisheries 622	
	FIPs Only		MSC Full Assessment		MSC Certified		Total	
	Landings ('000 tonnes)	% of Global Landings	Landings ('000 tonnes)	% of Global Landings	Landings ('000 tonnes)	% of Global Landings	Landings ('000 tonnes)	% of Global Landings
Crabs, lobsters, crustaceans	153	6.3%	3	0.1%	246	10.1%	402	16.4%
Major tuna species <sup>3</sup>	1,336	27.4%	109	2.2%	979	20.1%	2,424	49.7%
Miscellaneous fish	523	1.7%	581	1.8%	552	1.8%	1,656	5.3%
Molluscs	20	0.8%	6	0.3%	1,030	43.2%	1,057	44.3%
Other tunas, bonitos, billfishes	103	4.1%	0	0.0%	4	0.2%	107	4.3%
Salmon and diadramous fish	18	1.8%	30	3.0%	348	34.1%	396	38.8%
Shrimp	478	14.2%	35	1.1%	364	10.8%	877	26.1%
Small Pelagics	4,244	24.7%	358	2.1%	976	5.7%	5,578	32.4%
Squid / Octopus	112	2.4%	0	0.0%	0	0.0%	112	2.4%
Whitefish	506	5.1%	282	2.8%	5,185	52.4%	5,973	60.3%
<b>Total<sup>4</sup></b>	<b>7,493</b>	<b>9.3%</b>	<b>1,405</b>	<b>1.7%</b>	<b>9,685</b>	<b>12.0%</b>	<b>18,583</b>	<b>23.0%</b>

Note: Given data collection limitations, **FIP landings estimates are subject to potentially significant inflation, particularly for major tuna species.** For many fisheries, like tuna, there is no way of differentiating between landings participating within or outside of a FIP, especially when a FIP covers an entire stock at a national level or by engaging RFMOs. Estimating landed tonnage of FIPs is problematic, as 100% of fisheries’ or stocks’ total landings are often counted in the reported landed tonnage for a FIP, as long as some fraction of the fishery’s boats are participating in the FIP or if the FIP stakeholders are engaging national or regional management bodies.

<sup>1</sup> Landings exclude landings associated with Stage 0, Stage 1, and Stage 6 (MSC-certified) FIPs. In instances where there was overlap between reported FIP landings and MSC-certified landings (in the case of Stage 6 FIPs) landed tonnage was counted towards MSC landings.

<sup>2</sup> The number of FIP fisheries is substantially larger in 2016 than in previous years, primarily due to changes in SFP’s methodology for categorizing FIP fisheries. Note that FIP fisheries are subunits of FIPs. For example, if a single FIP engages multiple gear types or regions within the same fishery, these would be considered separate FIP fisheries within the same FIP.

<sup>3</sup> Major tuna species include: Albacore, Bigeye, Bluefin, Little Tunny (Black Skipjack), Skipjack, and Yellowfin Tuna.

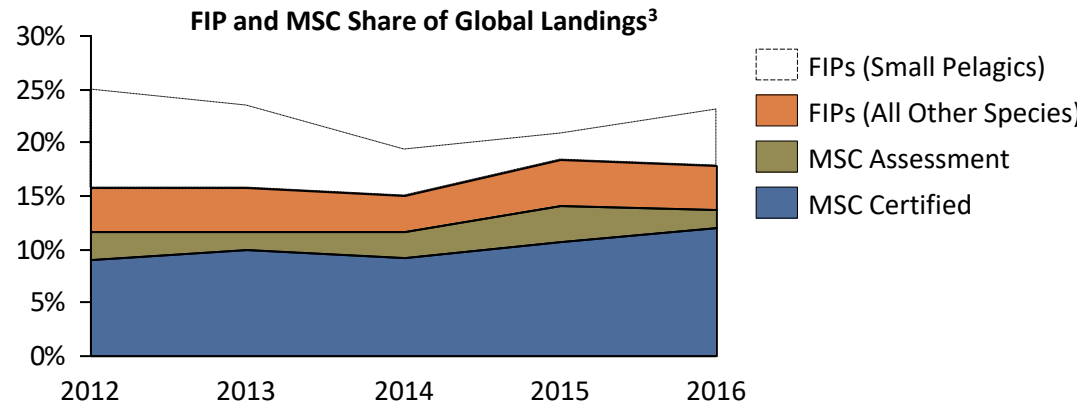
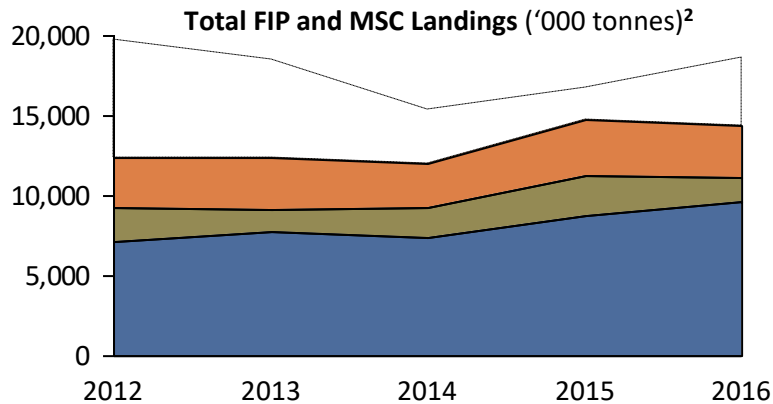
<sup>4</sup> Global landings varied annually, so both the numerator and denominator are dynamic when calculating the percentage of global landings engaged.

## PRODUCER-LEVEL PROGRESS

Since 2014, the share of global landings engaged by FIPs has grown by 1.6% and the total share engaged by both FIPs and MSC has grown by 3.6%

Total landing volume in FIP and the MSC program over time

All Species Totals	FIPs Only			MSC Full Assessment			MSC Certified			Total		
	# FIP <sup>1</sup> Fisheries	Landings <sup>2</sup> ('000 tonnes)	% of Global <sup>3</sup> Landings	# UoC MSC Assessment	Landings ('000 tonnes)	% of Global <sup>3</sup> Landings	# UoC MSC Certified	Landings ('000 tonnes)	% of Global <sup>3</sup> Landings	# FIP/MSC Fisheries	Landings ('000 tonnes)	% of Global <sup>3</sup> Landings
2012	52	10,490	13.3%	105	2,130	2.7%	170	7,080	9.0%	327	19,700	25.0%
2013	73	9,391	11.9%	99	1,292	1.6%	207	7,807	9.9%	379	18,490	23.5%
2014	123	6,090	7.7%	98	1,918	2.4%	251	7,348	9.3%	472	15,356	19.4%
2015	151	5,459	6.8%	88	2,587	3.2%	257	8,690	10.8%	496	16,736	20.7%
2016	269	7,493	9.3%	59	1,405	1.7%	294	9,685	12.0%	622	18,583	23.0%



Note: Given data collection limitations, **FIP landings estimates are subject to potentially significant inflation, particularly for major tuna species.** For many fisheries, like tuna, there is no way of differentiating between landings participating within or outside of a FIP, especially when a FIP covers an entire stock at a national level or by engaging RFMOs. Estimating landed tonnage of FIPs is problematic, as 100% of fisheries' or stocks' total landings are often counted in the reported landed tonnage for a FIP, as long as some fraction of the fishery's boats are participating in the FIP or if the FIP stakeholders are engaging national or regional management bodies.

<sup>1</sup> The number of FIP fisheries is substantially larger in 2016 than in previous years, primarily due to changes in SFP's methodology for categorizing FIP fisheries. Note that FIP fisheries are subunits of FIPs. For example, if a single FIP engages multiple gear types or regions within the same fishery, these would be considered separate FIP fisheries within the same FIP.

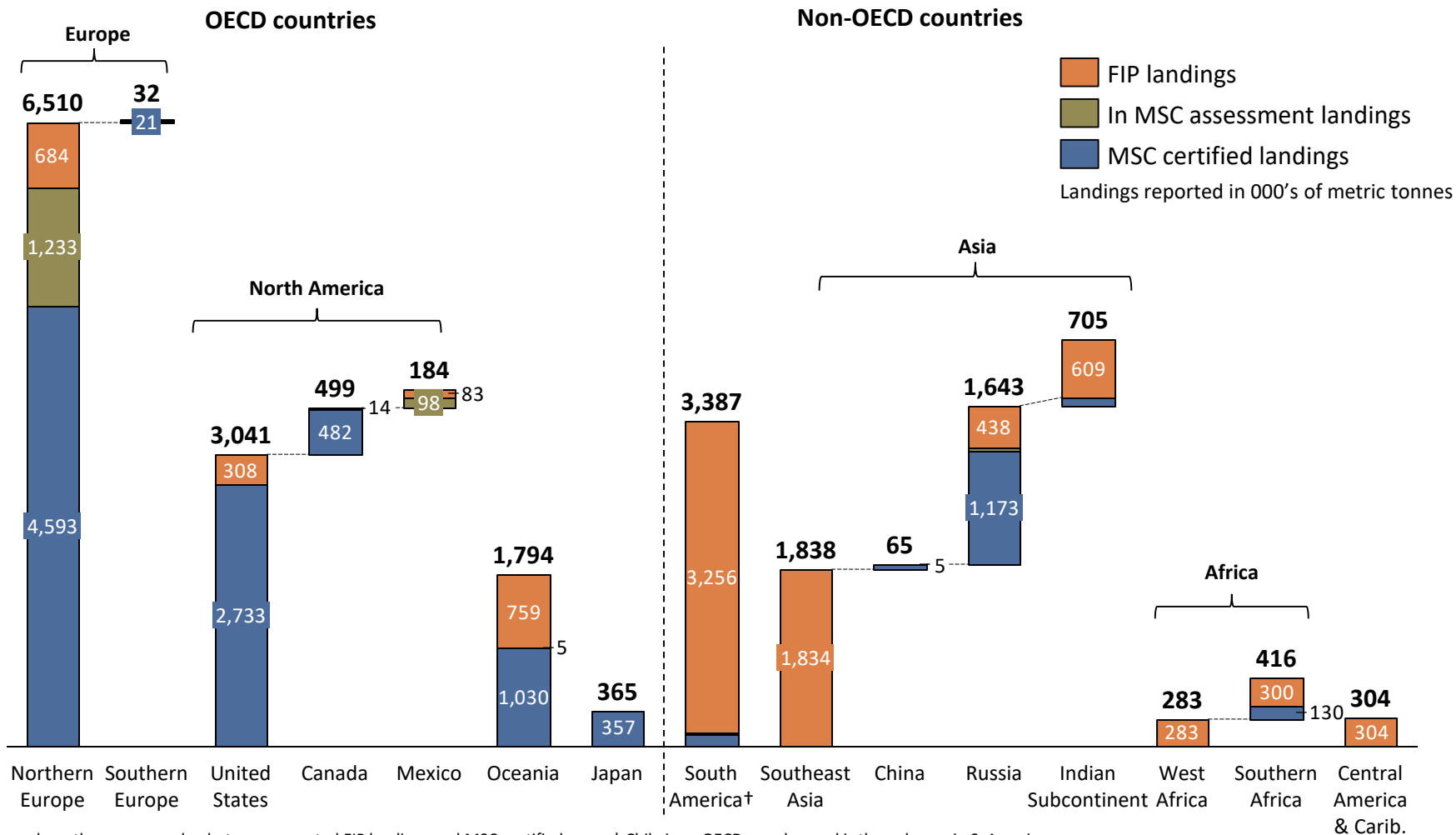
<sup>2</sup> Landings exclude landings associated with Stage 0, Stage 1, and Stage 6 (MSC-certified) FIPs. ISSF associated landings are excluded for all years. In instances where there was overlap between reported FIP landings and MSC-certified landings (in the case of Stage 6 FIPs) landed tonnage was counted towards MSC landings.

<sup>3</sup> Global landings vary annually, so both the numerator and denominator are dynamic when calculating the percentage of global landings engaged in each year.



Europe, North America, and Russia have the most MSC-certified landings, while the rest of the world has more landings engaged by FIPs

Global landings engaged in sustainable seafood interventions<sup>‡</sup>

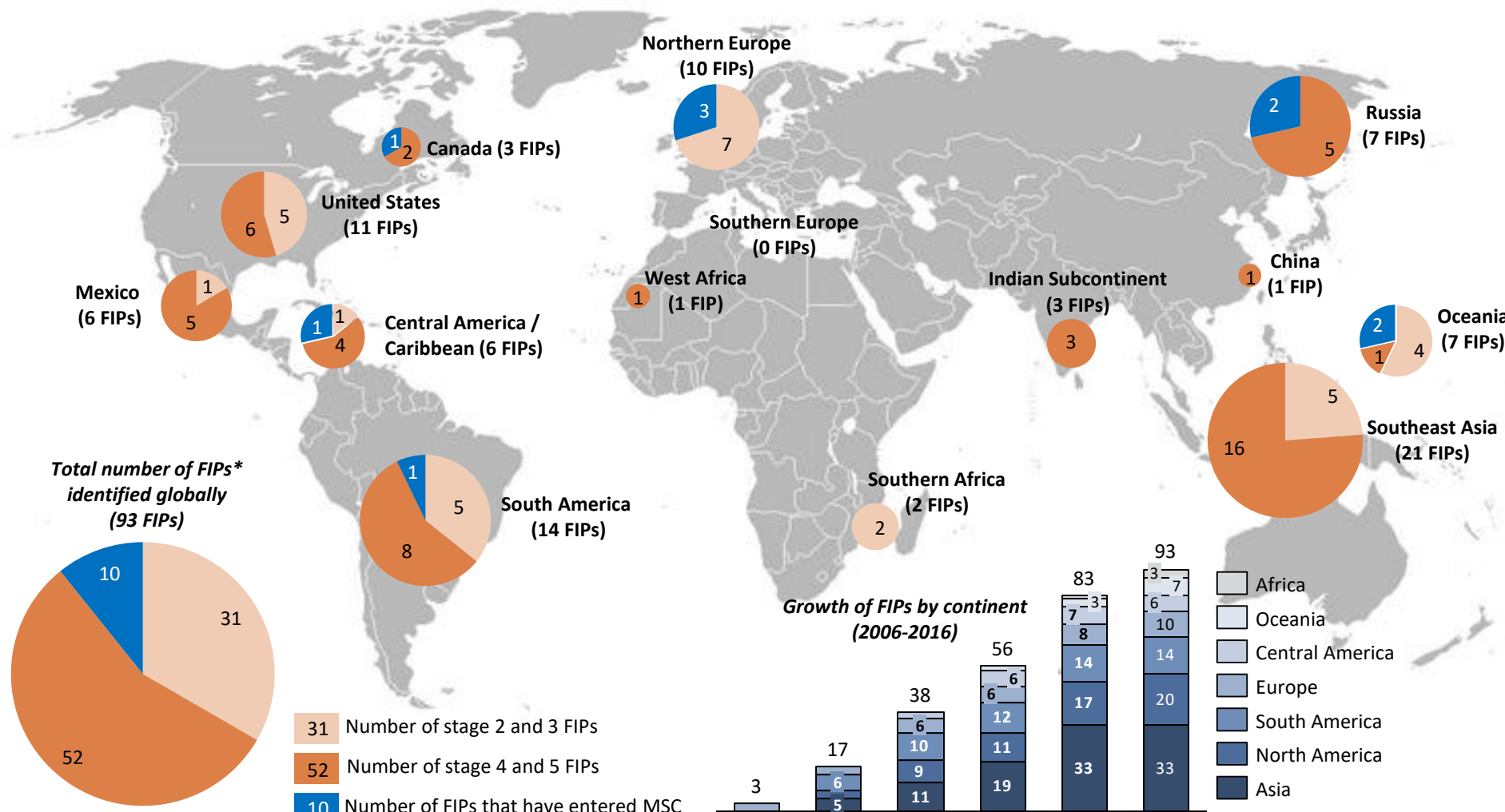


‡ - In instances where there was overlap between reported FIP landings and MSC-certified landings (in the case of Stage 6 FIPs) landed tonnage was counted towards MSC landings.

† Chile is an OECD member and is the only one in S. America

# PRODUCER-LEVEL PROGRESS

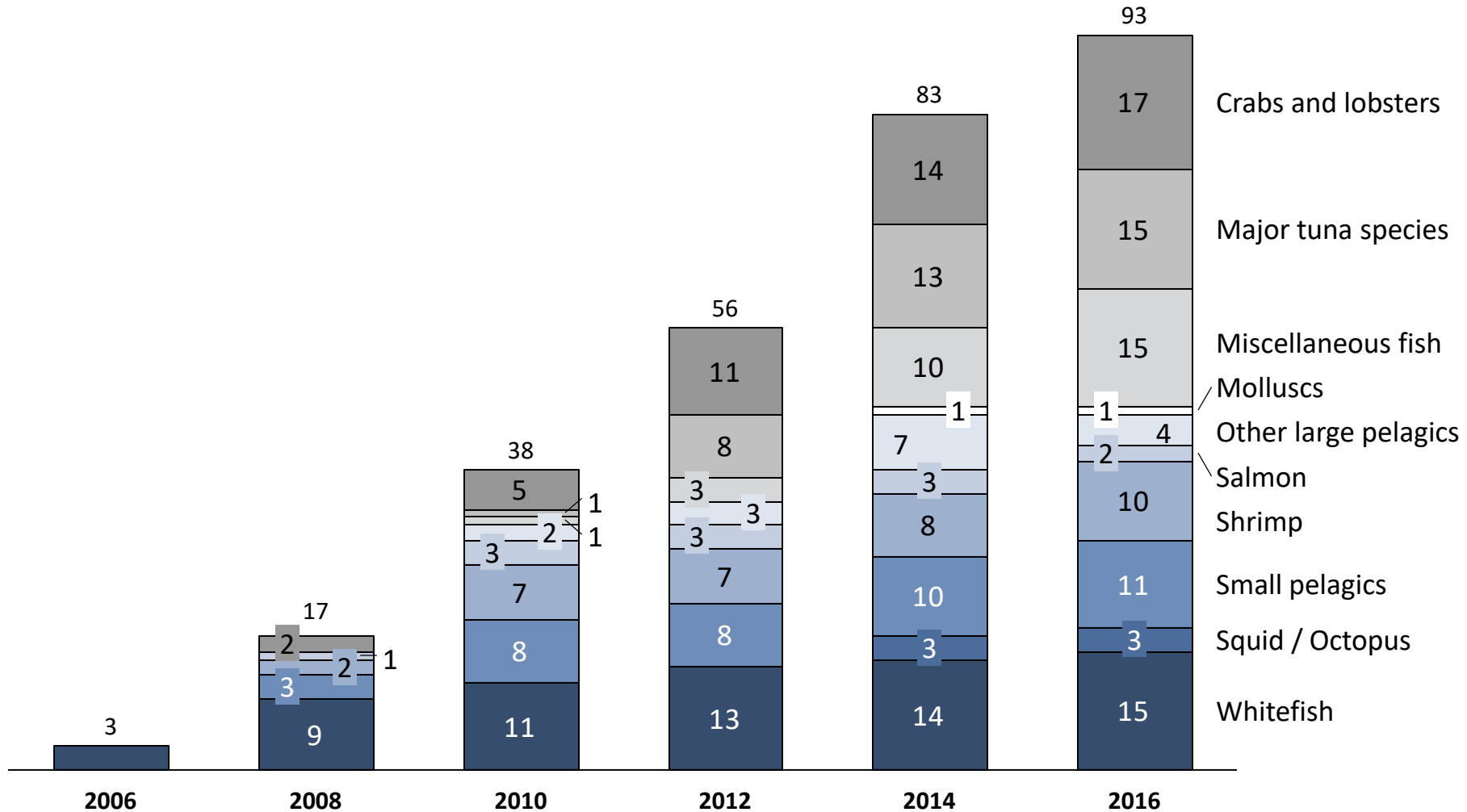
FIPs continue to grow worldwide; most growth since 2014 has occurred in Oceania and North America



\* At or past stage 2, excluding ISSF

## PRODUCER-LEVEL PROGRESS

FIPs have diversified into a broad range of major seafood commodities following an early concentration in whitefish



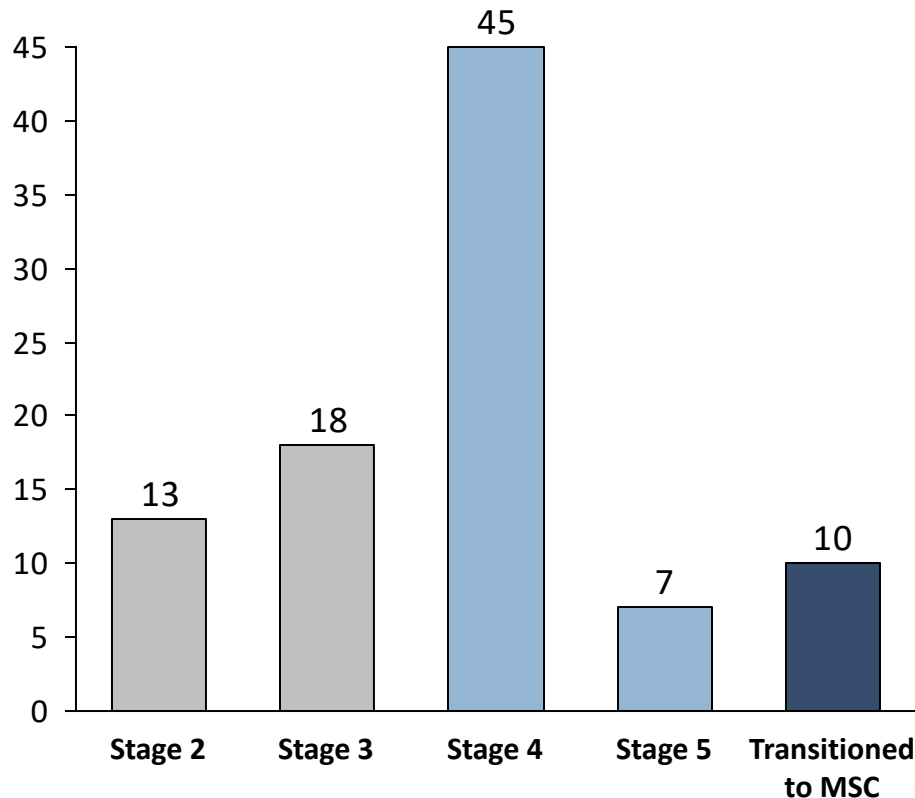
\* Excludes ISSF

## PRODUCER-LEVEL PROGRESS

While some first generation FIPs, largely in the U.S. and Europe, have advanced to the stage of creating change on the water, many others have not

FIPs are classified by “stage.” By definition, advanced FIP fisheries must report improvements in practice or policy (stage 4) and/or improvements in fishery health in the water (stage 5); earlier stage FIPs have formulated a work plan and made progress towards achieving their objectives.

### Number of FIPs



### Stage 5 FIPs (7)

- Ecuador mahi
- Indonesia national tuna
- Newfoundland cod
- Nicaragua spiny lobster
- Russian Far East crab
- Vietnam blue swimming crab
- Vietnam yellowfin tuna

### FIPs that have entered MSC (10)

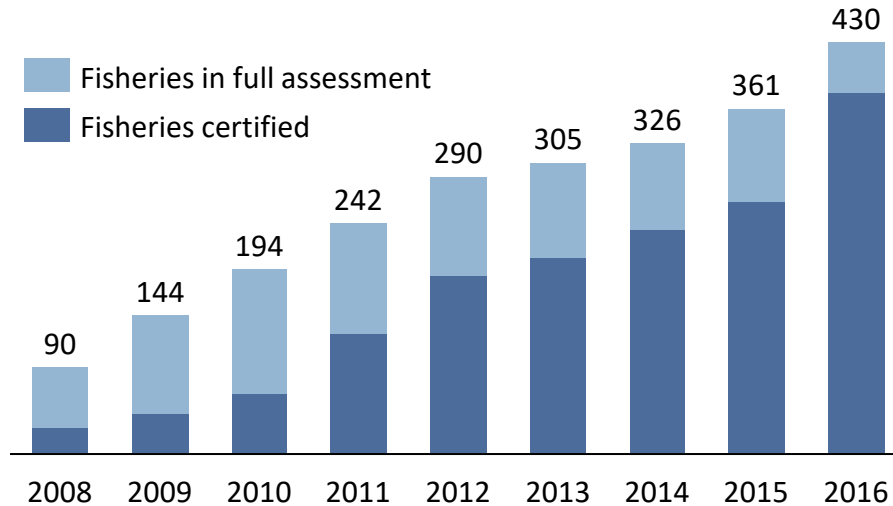
- Argentina hoki
- Bahamas spiny lobster
- Baltic cod
- Barents Sea cod and haddock
- Cook Islands albacore
- Eastern Canadian cod
- German Eastern Baltic cod
- New Zealand orange roughy
- Russian pollock
- Western Kamchatka salmon

\* Excluding ISSF

## PRODUCER-LEVEL PROGRESS

The number of certified fisheries increased by 33% between 2015 and 2016, however the growth rate of certified volumes remained more modest

**MSC-certified fisheries and fisheries in full assessment**



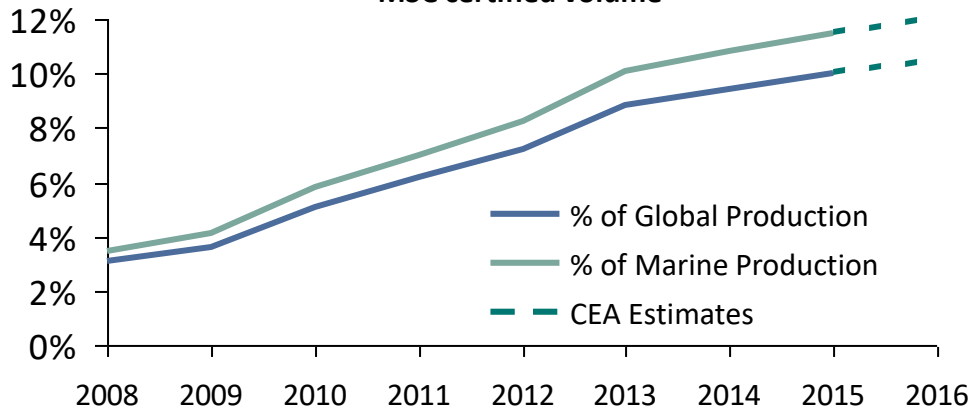
- The number of certified fisheries and fisheries in full assessment has almost quadrupled since 2008.

- In 2016, MSC certified more new fisheries than any year since the beginning of this dataset.

- In 2015, MSC certification covered approximately 11% of marine production and 10% of global production.

- MSC has certified approximately 83% of the total catch from the Northeast Pacific region between the United States and Canada.

**MSC certified volume**

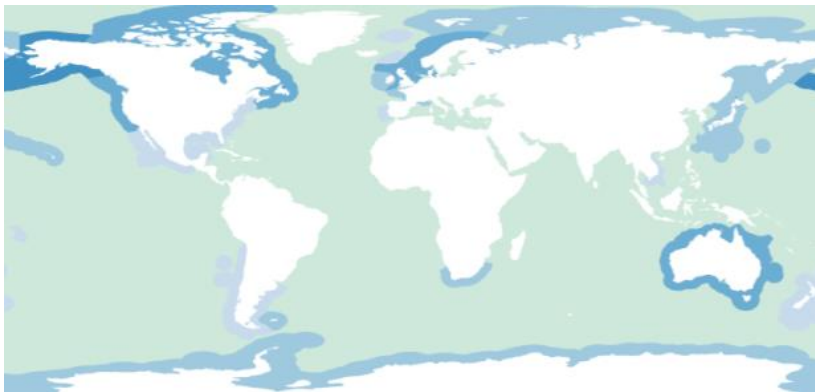


## PRODUCER-LEVEL PROGRESS

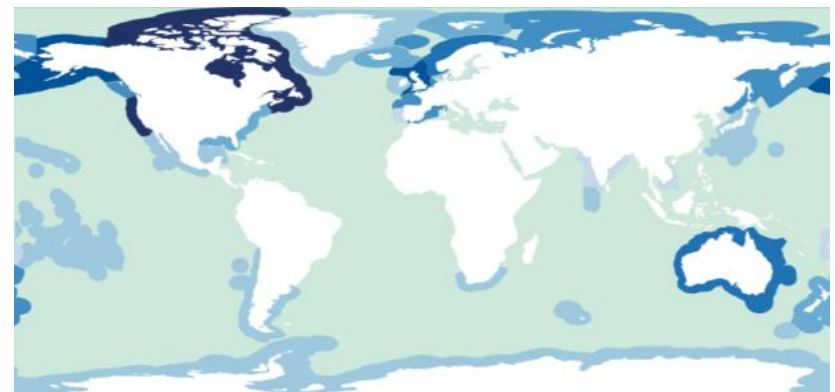
MSC-certified fisheries continue their global expansion, across all species groups. Engaging the Global South is priority, but progress there is grudging

**MSC has certified 281 fisheries in 33 countries as sustainable.** Since 2010, the number of MSC-certified cod, hake and haddock fisheries have more than doubled, and have the leading number of MSC certified fisheries globally.

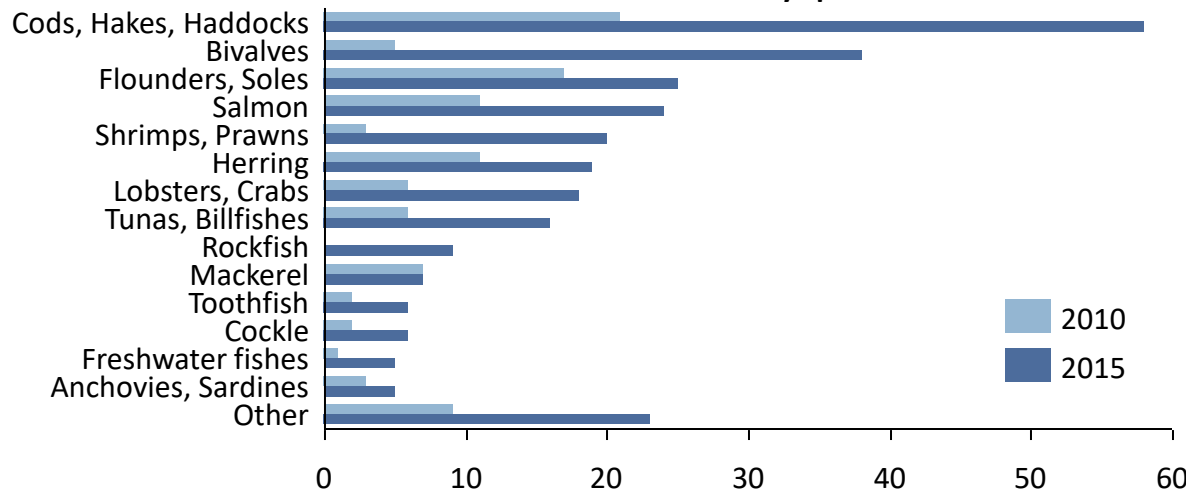
**Map A: Number of certified fisheries in 2010**



**Map B: Number of certified fisheries in 2015**

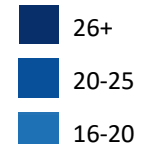


### Fisheries by species



#### Map A

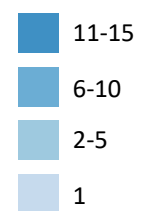
Number of certified fisheries in each country's Exclusive Economic Zone (EEZ) in 2010



#### Map B

Number of certified fisheries in each country's EEZ in 2015

(EEZs not shown for countries with no certified fisheries)



## PRODUCER-LEVEL PROGRESS

FisheryProgress.org continues to ramp up, efficiently organizing verified FIP information for interested buyers, consolidating over a dozen other FIP sites

**Launched in 2016, FisheryProgress.org has started providing businesses and NGOs with more consistent and reliable information on FIPs**, with the goal that buyers can make more informed decisions to meet their sustainable seafood commitments. FishChoice manages FisheryProgress.org day-to-day, while the Conservation Alliance for Seafood Solutions helped develop the guidelines that are the foundation of the website. Many North American NGO partners are ramping down their own FIP tracking websites in support of FisheryProgress.org.

### Current Progress on FisheryProgress.org:

- 52 FIPs published (19 basic and 29 comprehensive, 4 prospective)
- 22 different FIP implementer groups
- 22 countries represented in FIPs, in addition to 14 high seas FIPs
- Of the 450 registered users, 150 are industry members
- Each FIP has an A-F progress rating, thanks to coordination with Sustainable Fisheries Partnership, so buyers can see how quickly the FIP is advancing toward its goals

### Map of FIPs on FisheryProgress.org



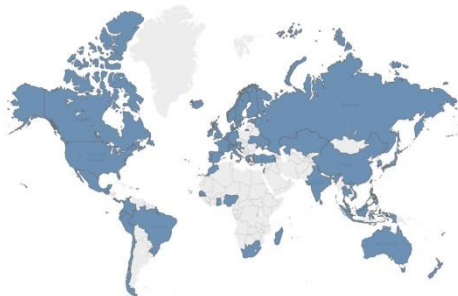
*Green refers to basic FIPs, while blue refers to comprehensive FIPs.*

## Friend of the Sea and Global Trust also certified a number of fisheries globally



Friend of the Sea (FOS) is an international sustainability certification program for fisheries and aquaculture products originating from all continents.

- 88 fisheries in 45 countries have been approved by FOS Sustainable Fisheries criteria, with 30 added in 2016. These fisheries now cover 27 different species.
- Over 150 aquaculture producers have requested auditing, with more than 100 having achieved certification thus far.
- FAO labels more than 2,000 products (up from 600 in 2013). More than 500 companies from over 60 countries have been certified.



Global Trust is an ISO-accredited certification body for fisheries and seafood that certifies products in over 25 countries.

Global Trust also engages with eco-certifications in development and provides their certification services against FAO standards. These include Alaska Responsible Fisheries Management Certification (7 fisheries certified) and Icelandic Fisheries Certification (4 fisheries certified), both of which have been recognized by GSSI.

Global Trust also assisted in the development of Ireland’s new certification standard, launched in March 2017.



Iceland Responsible Fisheries Management fisheries: cod, haddock, saithe, golden redfish.



Alaskan Fisheries Certification: salmon, halibut, cod/sablefish, pollock, king and snowcrab, flatfish.



Ireland’s Seafood Development Agency (BIM) developed its own certification standard, with expertise from Global Trust with regards to catch, traceability, and social sustainability.



## PRODUCER-LEVEL PROGRESS

GSSI’s benchmarking process aims to provide clarity on sustainable seafood certification programs. Currently MSC, ASMI, and Iceland RFM are “recognized”

**In 2016, the Global Sustainable Seafood Initiative (GSSI) began benchmarking sustainable seafood schemes.** GSSI does not undertake any accreditation or certifications of its own. Its Global Benchmark Tool engages a variety of stakeholders while incorporating FAO guidelines to develop a set of requirements and indicators to monitor seafood certification schemes.

### GSSI Funding Partners:

- 34 companies from across the seafood industry
- FAO
- 6 non-profit affiliated partners

The following 19 retailer companies are supporters of GSSI, and pledged to recognize all GSSI-recognized certification schemes as acceptable when sourcing certified seafood:



### Current benchmarked certifications and programs:

- Alaska’s Responsible Fisheries Management (RFM) Certification Program was the first accepted, in July 2016.
- Iceland Responsible Fisheries Management Certification Programme (IRFM) was certified in November 2016.
- MSC became the first global sustainable seafood certification program to achieve recognition from GSSI, in March 2017.

### Certifications/programs expressing interest or in the process of being benchmarked by GSSI include:

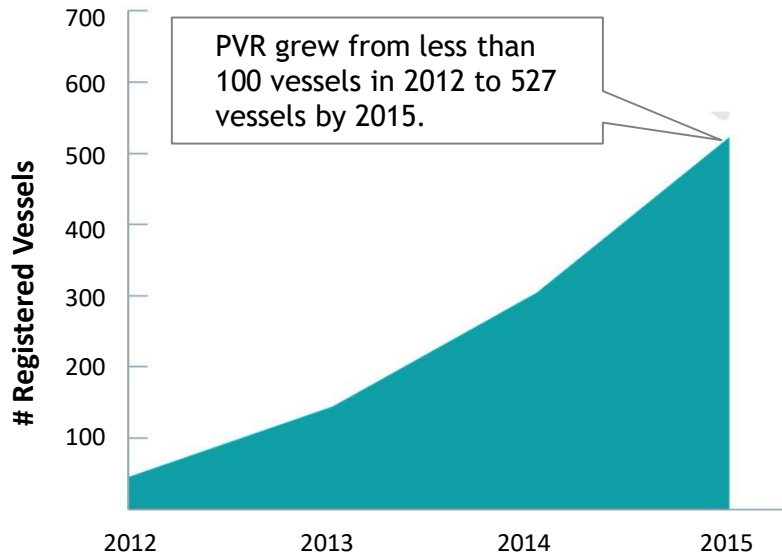
- Friend of the Sea
- Japan MEL

## PRODUCER-LEVEL PROGRESS

# The International Seafood Sustainability Foundation (ISSF) grows ProActive Vessel Register (PVR) fivefold since 2012, improving accountability

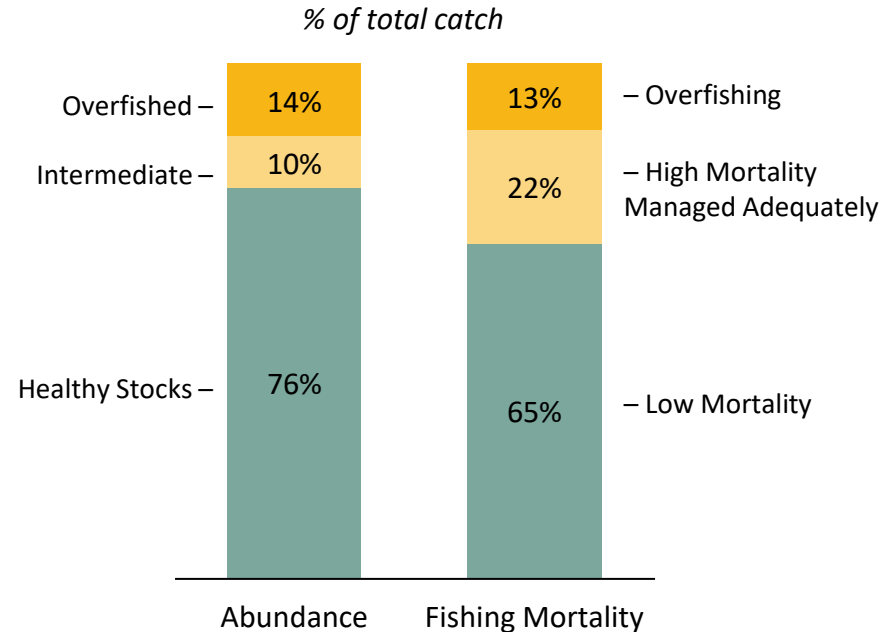
**The International Seafood Sustainability Foundation (ISSF) launched in 2009 as a partnership between the tuna industry, scientists, and environmental champions.** In 2015, ISSF’s advocacy work spanned 31 countries, supporting 23 policy amendments surrounding bycatch reduction, illegal fishing elimination, and capacity management at the Regional Fisheries Management Organization (RFMO) level.

**Growth of PVR**



ISSF has propelled the PVR, a mechanism for identifying individual vessels with sustainable tuna fishing practices.

**ISSF Major Commercial Tuna Rankings, Feb. 2017**



ISSF’s report, *The Status of the World Fisheries for Tuna*, provides annual scientific assessment and rankings for 23 major tuna stocks.

## PRODUCER-LEVEL PROGRESS

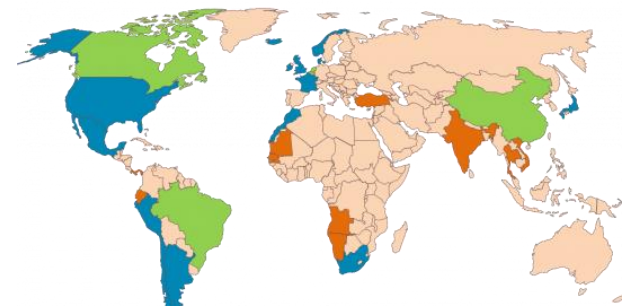
The IFFO RS standard continues to gain global traction as the industry’s choice for sustainable fishmeal and fish oil certification

**Around 45% of global fishmeal and fish oil production is now compliant with the IFFO Global Standard for Responsible Supply (IFFO RS).** More than 110 factory sites and units have been independently audited and certified against the IFFO RS Standard.

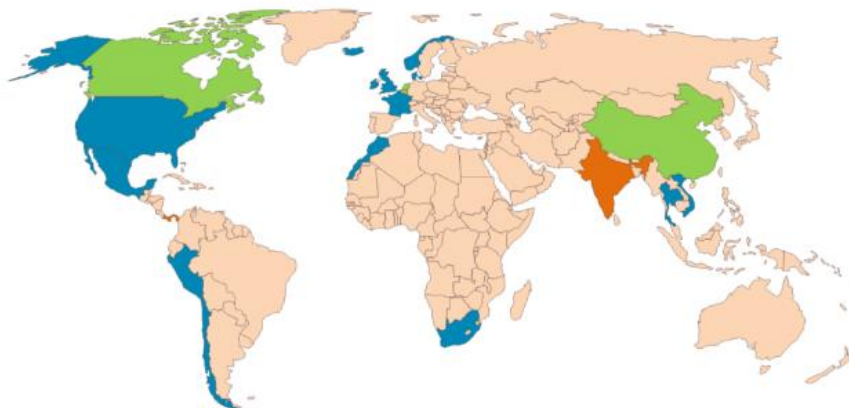
### IFFO RS Requirements

1. Source whole-fish raw material from the FAO Code of Conduct for Responsible Fisheries
2. Avoid the use of IUU fish or by-products of IUCN relisted fish
3. Manufacture under a robust quality control scheme

### IFFO RS Projected Global Reach by 2022



### IFFO RS Global Reach 2016

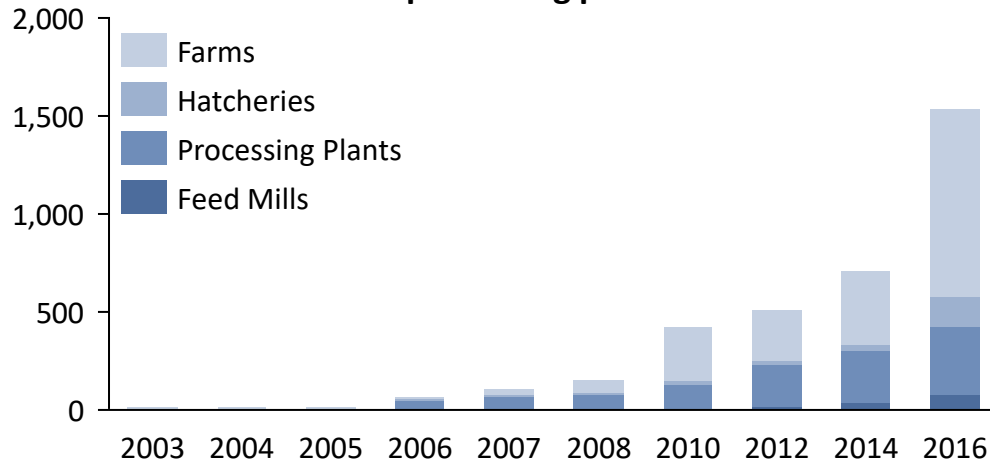


Standard	Description
IFFO RS	Certifies marine ingredient producers globally.
IFFO RS CoC	Allows marine ingredient users to demonstrate responsible sourcing.
IFFO RS IP	Encourages marine ingredient producers to implement improvements toward IFFO RS certification.

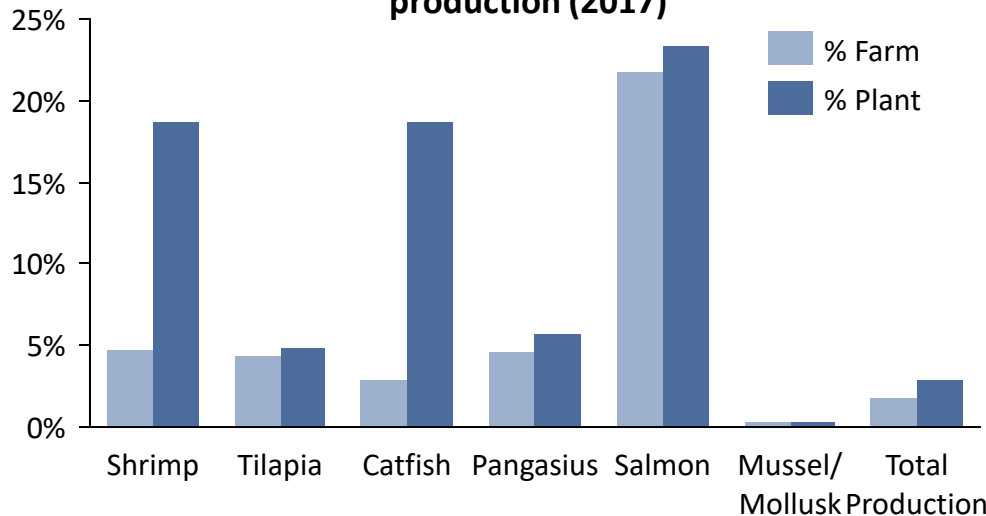
## PRODUCER-LEVEL PROGRESS

The number of GAA-certified farms grew by more than 150% from 2014 to 2016, and certified volume continues to outpace overall growth in aquaculture

**GAA-certified farms, hatcheries, feed mills, and processing plants**



**GAA-certified farm and plant volume as share of global production (2017)**



- Best Aquaculture Practices (BAP) has more than 1,600 facilities certified worldwide.
- The number of Global Aquaculture Alliance (GAA)-certified farms has doubled in the past two years and increased more than fourfold since 2009.
- GAA has developed standards for:
  - Finfish & Crustacean Farms
  - Finfish, Crustacean & Mollusk Hatcheries & Nurseries
  - Seafood Processing & Repacking Plants
  - Salmon Farms
  - Mollusk Farms
  - Feed Mills
- In January 2017, GAA launched an online portal that allows processing plants, farms, hatcheries, and feed mills to apply for BAP certification and recertification online.

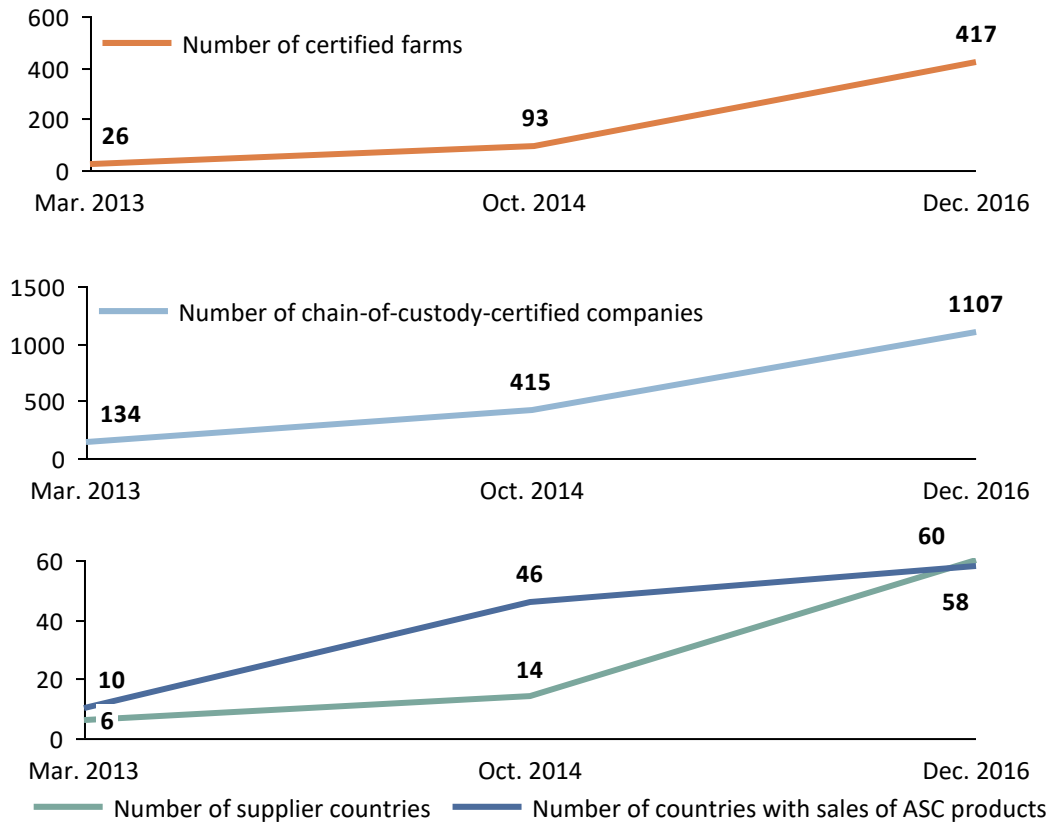


## PRODUCER-LEVEL PROGRESS

The Aquaculture Stewardship Council is also scaling rapidly, having increased the number of certified farms fourfold in 2 years

**The Aquaculture Stewardship Council (ASC) has scaled rapidly since its entry into the space in 2010, adding additional standards and farms.** There are now over 7,000 approved ASC-labeled products, and over a million tons of seafood have been certified by ASC.

### Scale and reach of ASC



### Existing standards:

- Pangasius
- Tilapia
- Salmon
- Freshwater Trout
- Abalone
- Bivalve
- Shrimp
- Seriola and Cobia (added in 2016)

### Standards under development:

- ASC Feed Standard
- ASC Aligned Standard
- ASC-MSC Seaweed Standard
- Developing ASC Standards for New Species
- Operational Standards Review

### New certification methodologies:

- ASC multi-site certification methodology
- ASC group certification methodology

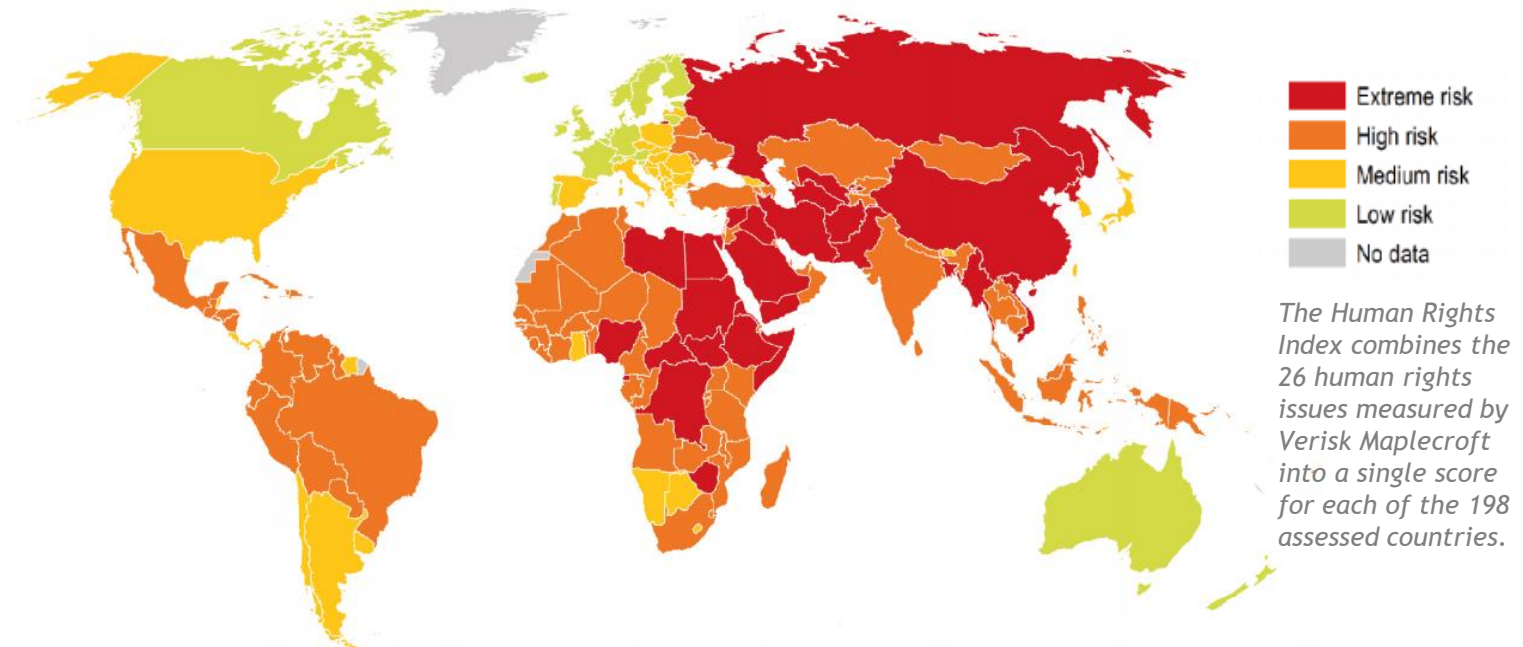
## PRODUCER-LEVEL PROGRESS

The sustainable seafood movement puts a new emphasis on addressing human rights violations in supply chains, which is closely linked to IUU fishing

**The risk of businesses being implicated in human rights abuse via their sourcing is highest for products sourced from Asia and Africa, regions where the sustainable seafood movement is heavily engaged and has begun to address these issues:**

- The Conservation Alliance for Seafood Solutions has added social and human rights components to its Common Vision, which is a set of guiding principles for North American seafood commitments.
- FIP implementers, such as Conservation International, are adopting social components to FIP action plans.
- Eco-certifications, like Fair Trade USA, are working to address human rights issues in seafood supply chains.

**Human Rights Risk Index 2016<sup>1</sup>**



Sources:

1. Verisk Maplecroft, "The Human Rights Risk Index 2016 – Q4."

\*For more information on investigative reports, see

[https://www.nytimes.com/interactive/2015/07/24/world/the-outlaw-ocean.html?\\_r=0](https://www.nytimes.com/interactive/2015/07/24/world/the-outlaw-ocean.html?_r=0)

and <https://www.ap.org/explore/seafood-from-slaves/>.

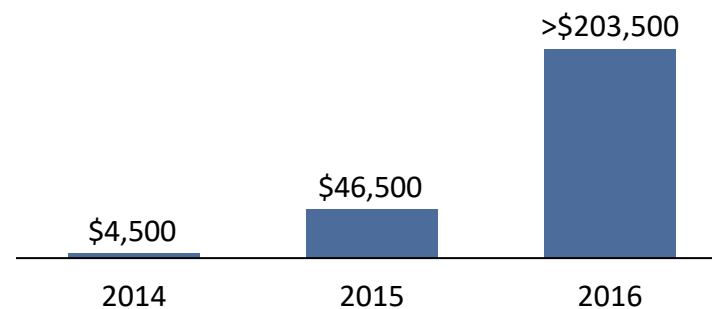
## Fair Trade USA has certified its first five fisheries

Fair Trade USA’s support of small-scale fishers and their communities has grown rapidly since finalizing its Capture Fisheries Standard and certifying its first fishery in Indonesia in 2014. Approximately 2,600 fishermen and processing workers currently receive Fair Trade premiums. Conversations are currently underway with a number of retailers and seafood importers in North America and Europe.



Species and Country	Fishermen and Processing Workers Covered Under the Fair Trade Standard	Certification Date
Yellowfin tuna, Indonesia	600	October 2014
Shrimp, Mexico	600	January 2016
Yellowfin tuna, Maldives	200	October 2016
Skipjack tuna, Maldives	1100	February 2017
Scallops, United States	100	April 2017

**Case Study:** Fair Trade fishermen in Indonesia earned \$46,500 in Fair Trade premium in 2015, up from \$4,500 in 2014 – a 900% increase. In 2016, Indonesian and newly certified Mexican fishermen received over \$203,500 in Fair Trade premiums.



# Consumption and Trade Dynamics

## Key takeaways

- Seafood consumption is projected to grow worldwide, with growth occurring three times as fast in developing countries. China has by far the largest national consumption, driven by a large population and above average per-capita consumption that is only projected to increase.
- The quantity of globally-traded high-value seafood has continued to boom. Markets beyond the U.S., the E.U., and Japan – especially those in South and Southeast Asia – are among the fastest growing importers of key commodities like shrimp, salmon, and tuna, though in some cases the product is destined for re-export.
- Markets with strong sustainable seafood demand in the U.S., Canada, and much of Northern Europe made up 35% of global imports by value in 2016, though this includes intra-continental trade that has no leverage on producer countries in need of fisheries management improvements. Further work to cultivate markets in Europe (19%) and Japan (9%) would contribute significant additional demand for sustainable seafood.

Global seafood consumption

Seafood trade flow data

Key commodity trade flow trends

### CONSUMPTION & TRADE DYNAMICS

Demand generated by sustainable seafood commitments is transmitted through international trade and the ability to engage fisheries is a function of the market's global reach. Unlike the other categories, trade dynamics are not generally considered an area of NGO focus.

corporate support help drive improved government regulations and enforcement

Corporate- NGO partnerships

Greenpeace's scorecard data

### BUSINESS RELATIONSHIPS & SUPPLY CHAIN ENGAGEMENT

A Influential businesses operationalize their commitments to sustainable seafood

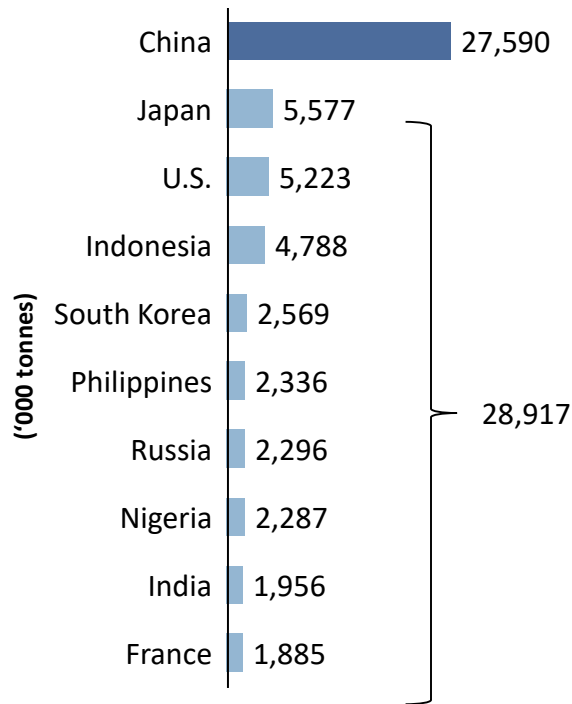


## CONSUMPTION AND TRADE DYNAMICS

Chinese seafood consumption equals that of the next 9 highest countries; per capita consumption is highest in Japan, Western Europe, and Oceania

**China has far and away the largest national seafood consumption, the result of above-average per capita consumption and a large population.** Per capita consumption is highest in small island nations, though their total consumption is relatively minor. Western Europe, Northern Europe, Oceania, and Southeast Asia round out the remaining regions with the highest seafood consumption per capita.

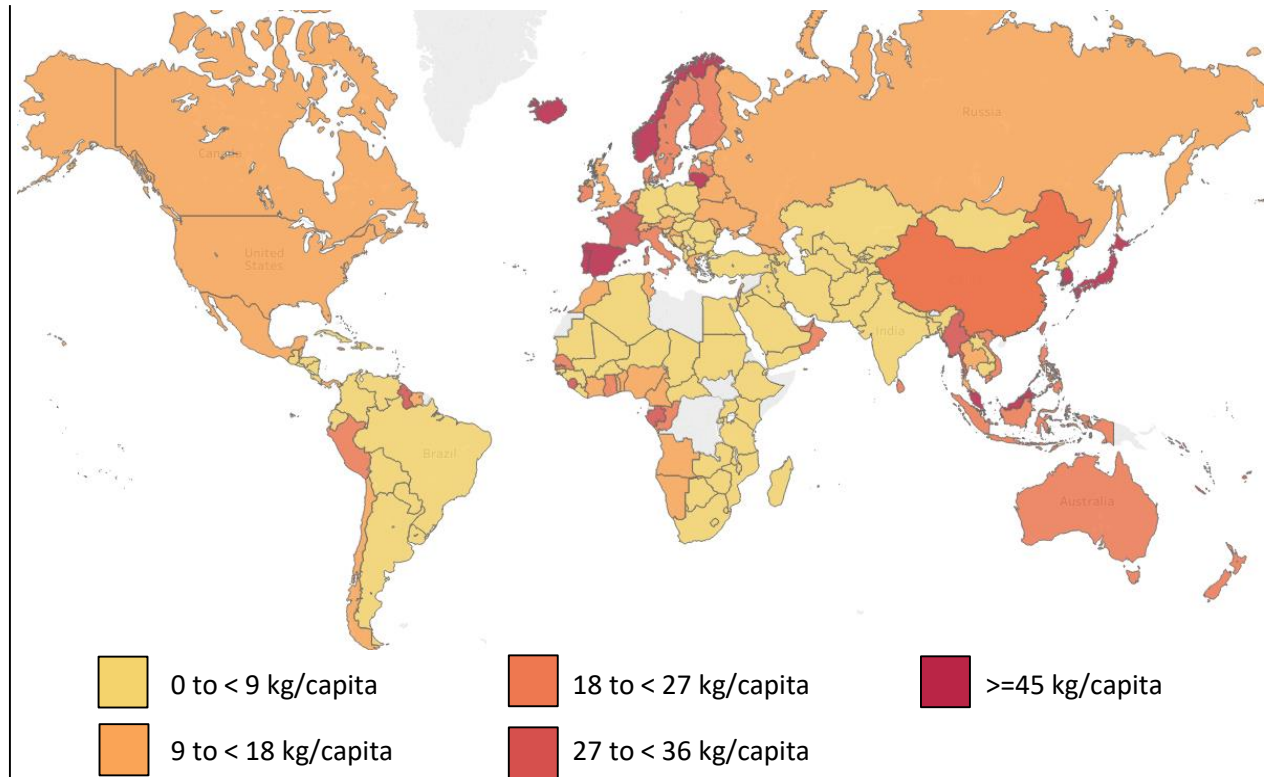
**Top 10 countries by total seafood consumption (2013)**



**Per capita seafood consumption (2013)**

Median: 10.5 kg/capita

Average: 16.0 kg/capita

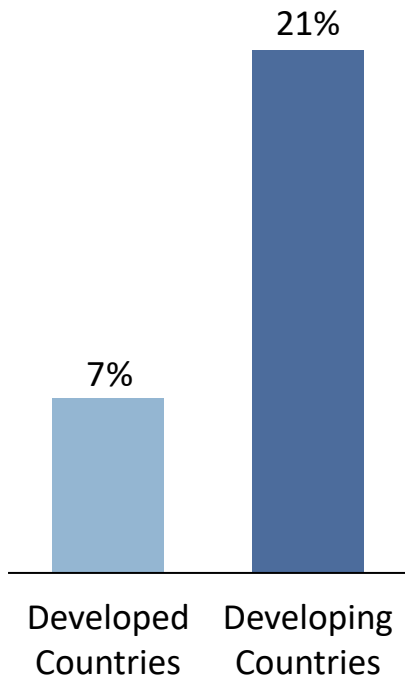


## CONSUMPTION AND TRADE DYNAMICS

Per-capita fish consumption is growing fastest in developing countries, a trend that is projected to continue through 2022

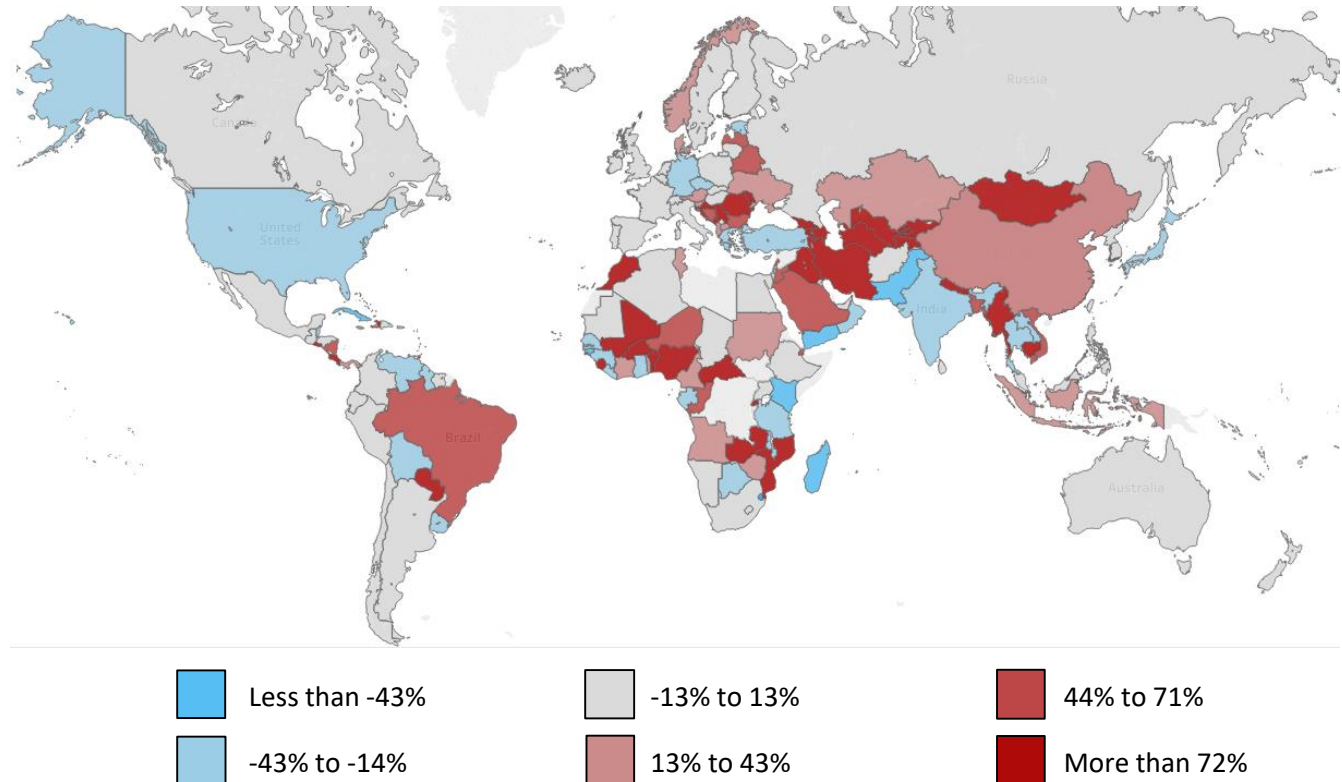
The growth of demand for fish from 2000 to 2013 was highest in Africa, Asia, and parts of South and Central America, due largely to growth in population, wealth, and urbanization. With over 37% of fish production traded annually, fish is the world's most traded food commodity. This trend is likely to continue: fish consumption in developing countries is expected to increase an additional 20% by 2022.

Projected growth of fish consumption (2013-2022)



Historic growth of per capita fish consumption (2000-2013)

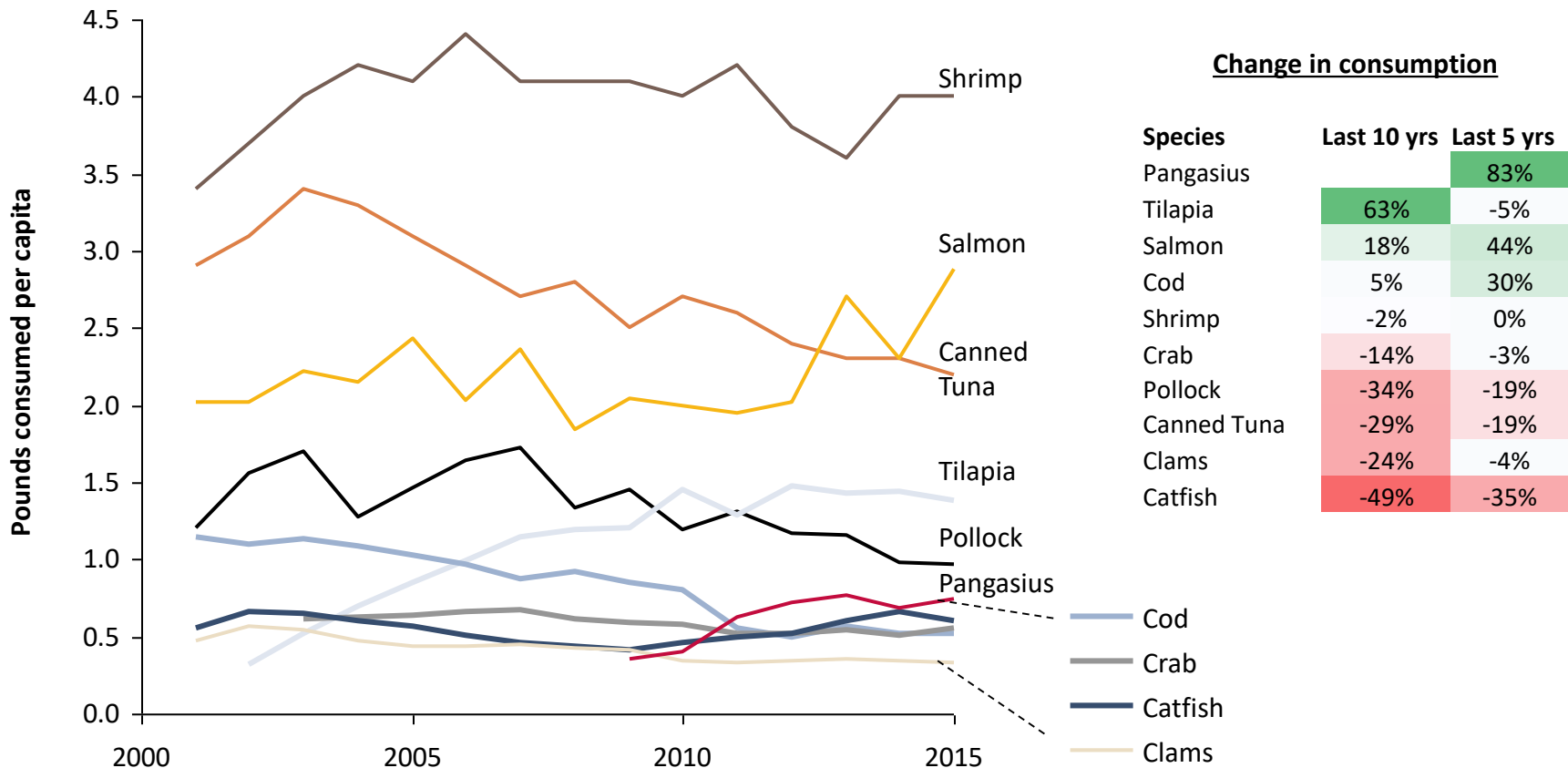
Median: 8.1%



## CONSUMPTION AND TRADE DYNAMICS

Shrimp, salmon, and canned tuna remain Americans' preferred seafoods. Salmon consumption is spiking, tilapia stabilized, and canned tuna slips

Over the past five years, the average American has consumed more salmon, pangasius, and cod, and has slowly decreased consumption of pollock, canned tuna, and catfish. Canned tuna consumption has fallen by almost 30% in the last decade, while tilapia consumption is remaining flat following more than a decade of growth. Other fisheries products exhibit stable or up-and-down trends in consumption.



## CONSUMPTION AND TRADE DYNAMICS

International trade empowers the market conservation movement by transmitting demand for sustainability to countries, fisheries in need of reform

**Substantial international trade broadcasts demand for sustainable seafood globally: 37% of global seafood volume is traded internationally, which makes seafood more highly traded than sugar (34%), wheat (19%), beef (13%), or poultry (12%).** These trade dynamics are the mechanisms through which North American and European demand and market leverage is transmitted to the countries and fisheries in need of reform.

### Global Seafood Trade (by continent)

IMPORTS BY VALUE (Inter- and intra-continental values in billions of USD)  
& PRODUCTION BY VOLUME (millions of tonnes)

**KEY**

- AFRICA
- ASIA
- EUROPE
- N.AMERICA
- OCEANIA
- S.AMERICA

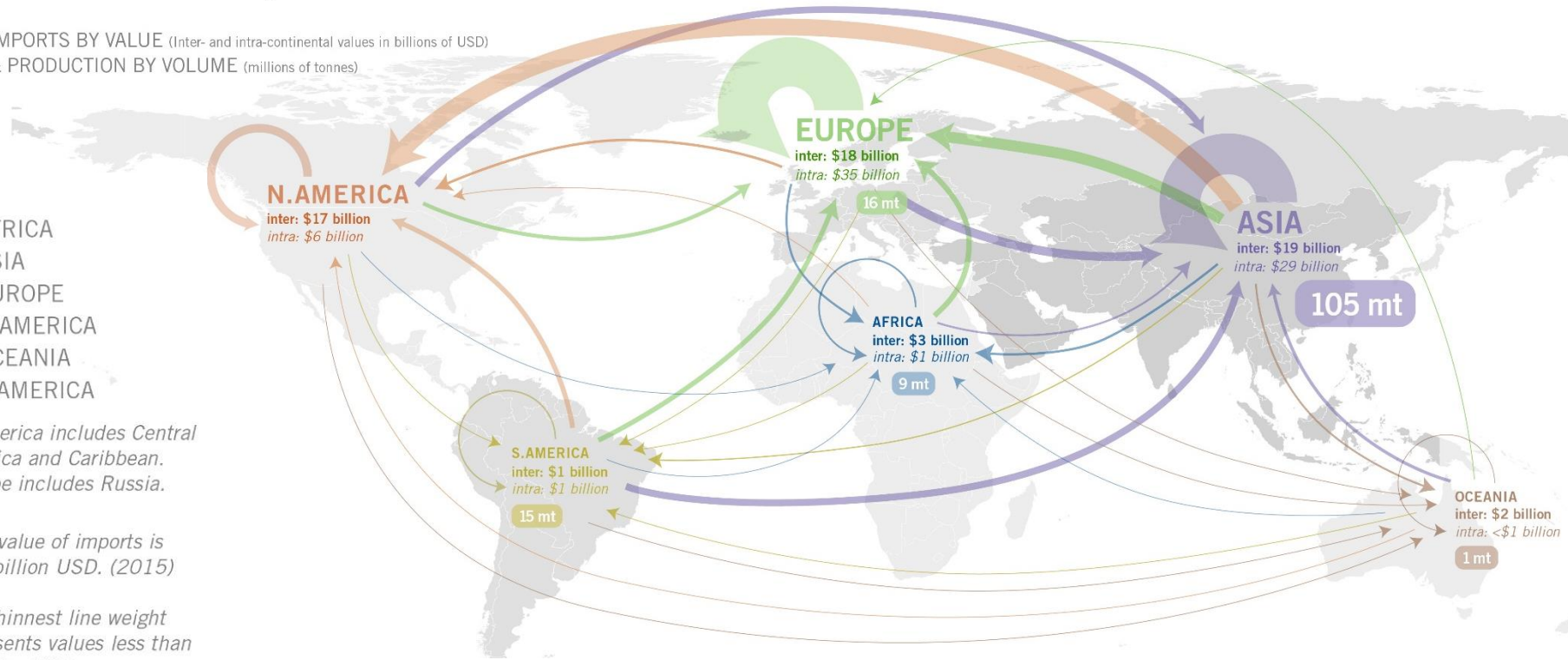
*N.America includes Central America and Caribbean.  
Europe includes Russia.*

*Total value of imports is 134 billion USD. (2015)*

*The thinnest line weight represents values less than 1 billion USD.*

**production** (2013)

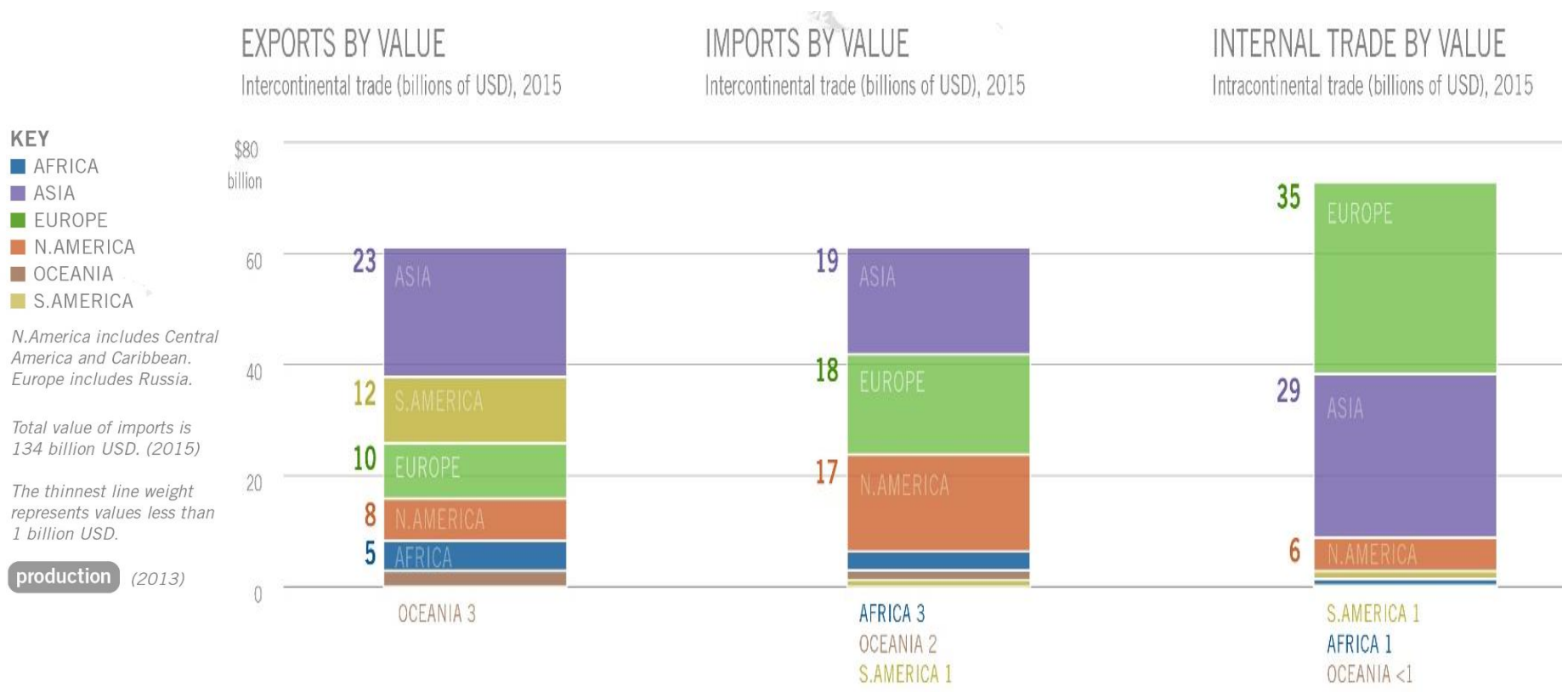
Source: International Trade Centre; trademap.org.



## CONSUMPTION AND TRADE DYNAMICS

However, intra-regional (internal) trade reduces the leverage that markets with sustainable demand can have on other continents, especially for Europe

**Trade among European countries is worth roughly double what Europeans import from other continents.** This limits the impact that European consumer demand can have on driving reforms in other regions. Asia appears to be the place where Western markets may have the most potential to influence poorly managed fisheries, but strong intra-Asian trade limits the overall influence in these markets to a few key commodities.



## CONSUMPTION AND TRADE DYNAMICS

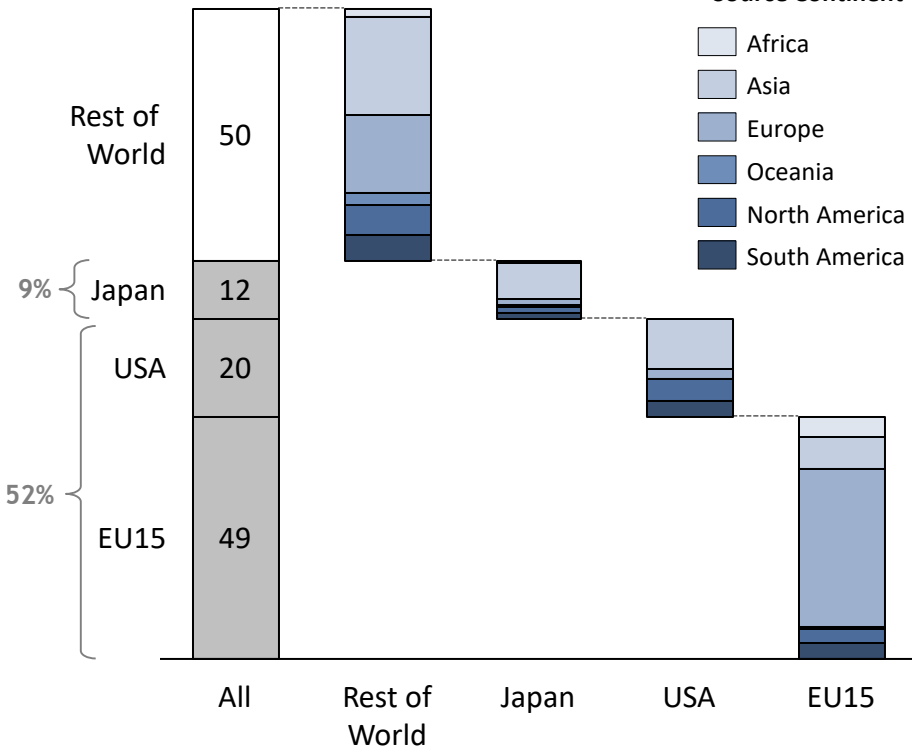
In 2016 the United States and the EU15 accounted for 52% of global seafood imports by value; Japan accounted for an additional 9%

- The United States and EU15, where sustainable seafood markets are most developed, accounted for 52% of global seafood imports by value in 2016.
- Japan, commonly identified as a next logical target for cultivating sustainable seafood markets, accounted for an additional 9% of global seafood markets by value. Japan primarily imports shrimp and tuna.
- Southern Europe is another logical target for further demand-side cultivation. In 2016, the value of imports into Southern Europe (19% of the global market) exceeded those of Northern Europe (18% of the global market).

**2016 Imported Value of Seafood by Continent**

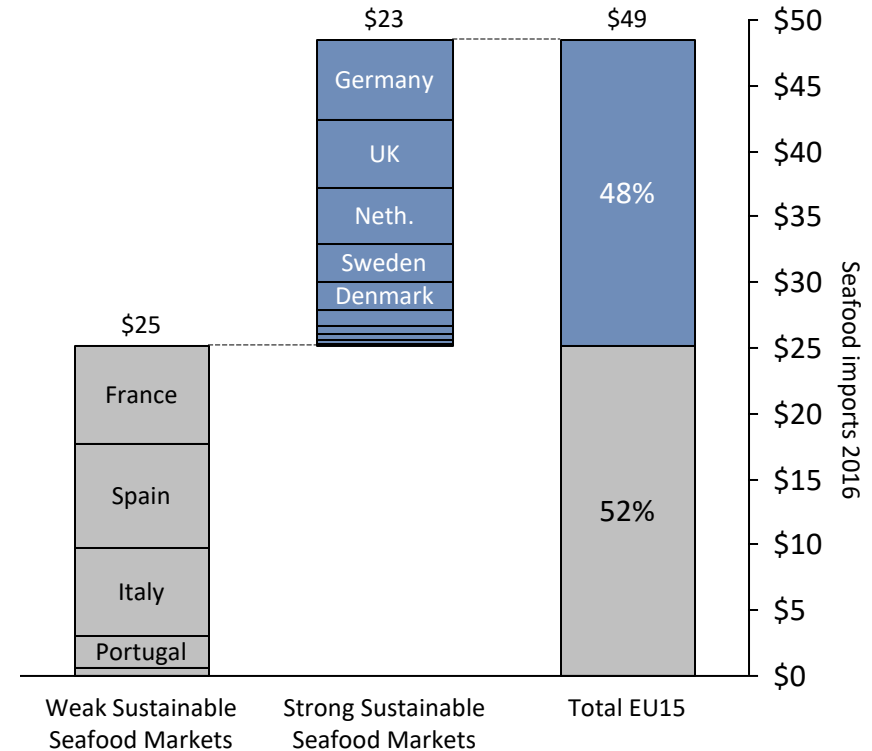
(USD Billions)

Source Continent



**Imported Value of Seafood for EU15 Member Countries**

(USD Billions)



## When discussing the potential scale of sustainable seafood, it is important to understand the limits of Western market-driven demand pressure

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**The demand for “sustainable” seafood remains largely limited to the United States, Canada, and Northern Europe, which together account for roughly one-third of imported seafood by value in 2016.**

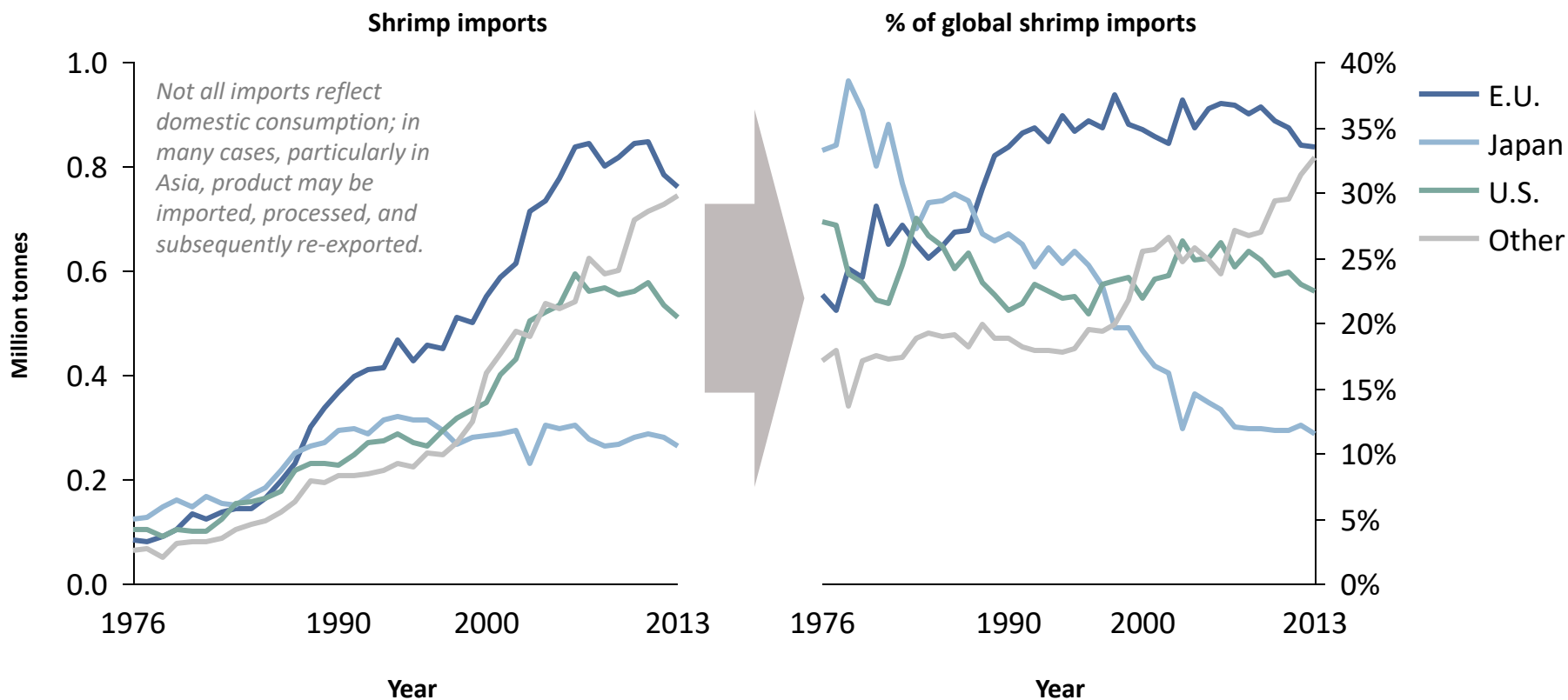
- The reach of market-based conservation interventions extends only as far as the demand for sustainable seafood. Currently that demand resides mainly in Northern Europe, North America, and Oceania, which account for roughly 35% of global imports by value.
- The United States itself imports a large portion of globally traded seafood and is the top trading partner for many exporting countries for a number of priority commodities. Setting aside lobster, however, the United States rarely imports more than 10-15% of global production for any given commodity.
- As discussed, importer-driven demand pressure is tempered by significant levels of intra-European and intra-Asian trade.

**These markets have strong preferences for a handful of commodities, many of which are already engaged in certification and FIPs. Opportunities for further engagement of fisheries vary:**

- **Crab:** Ongoing certification and FIPs in swimming crab are a priority; market dynamics for other crab species (e.g., king, spider) are a challenge for the expansion of market incentives
- **Lobster:** A few good candidates for additional lobster engagement remain; achieving impact in existing FIPs (e.g., in Honduras, Nicaragua) may be more effective than expanding to new countries (e.g., India, Indonesia)
- **Octopus:** Market programs have not had much traction with octopus fisheries
- **Salmon:** Limited expansion opportunity given wide adoption of MSC and FIPs already
- **Shrimp:** Cold water shrimp is largely certified and should not be a focus in the future, while progress in tropical shrimp fisheries remains elusive; interventions are present in every major supplier to North America, but progress is slow
- **Small pelagics:** Industry has settled on IFFO RS as the sustainability bar, which covers ~80% of small pelagic volume
- **Squid:** Market programs have not had much traction with squid fisheries, though a number of FIPs may be on the horizon
- **Tuna:** ISSF has strong coverage of tuna; potential gains could be made by improving coordination of all improvement efforts
- **Snapper/grouper:** Very challenging to achieve short- or medium-term success through market-mediated pressure
- **Whitefish:** Limited expansion opportunity in wild capture given wide adoption of MSC and FIPs already

## Commodity of particular interest – shrimp

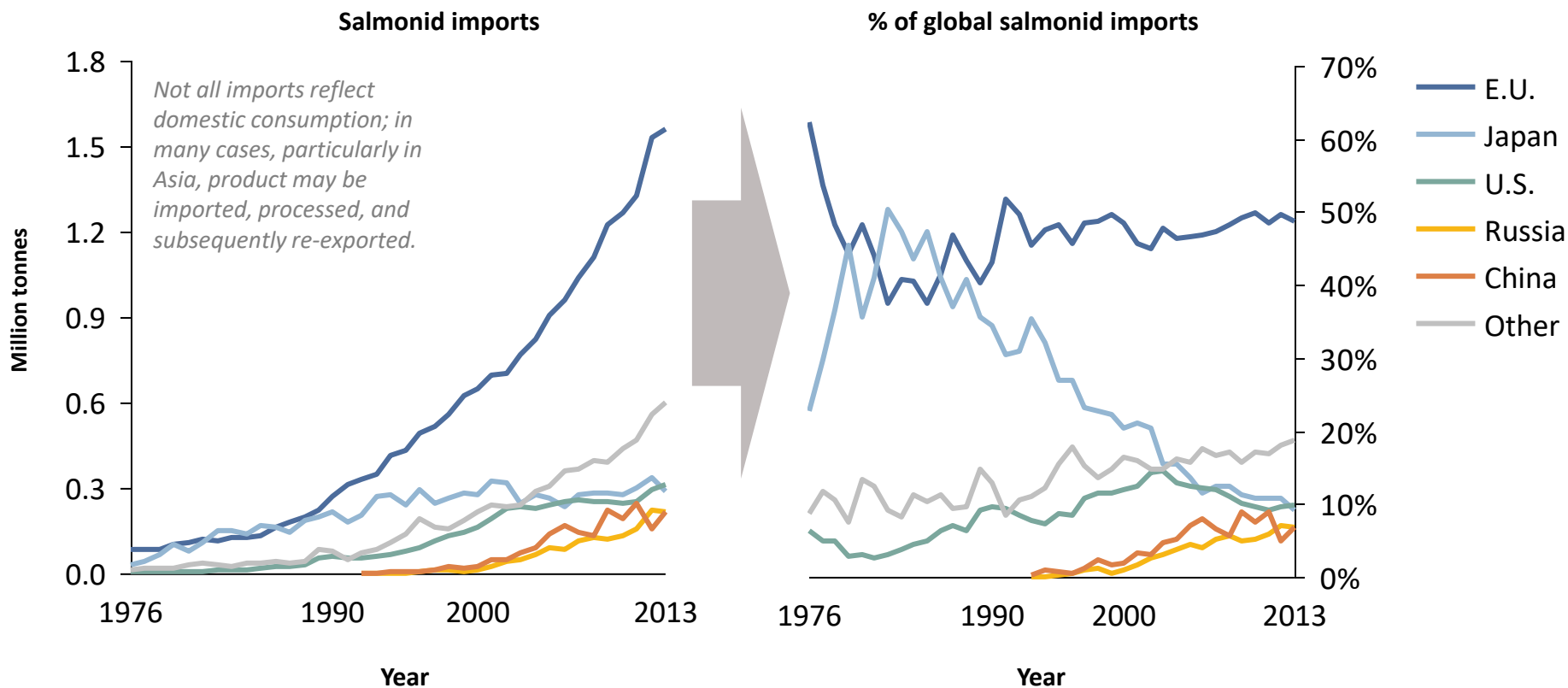
**Combined, the U.S., the E.U., and Japan imported roughly 68% of globally traded shrimp in 2013, but this share is declining.** The share imported by other countries increased more than 10% from 2003 to 2013. This growth is widely dispersed and no countries stand out as driving the new imports. Meanwhile, both total imports and the share imports to the E.U., U.S., and Japan have flagged in recent years.





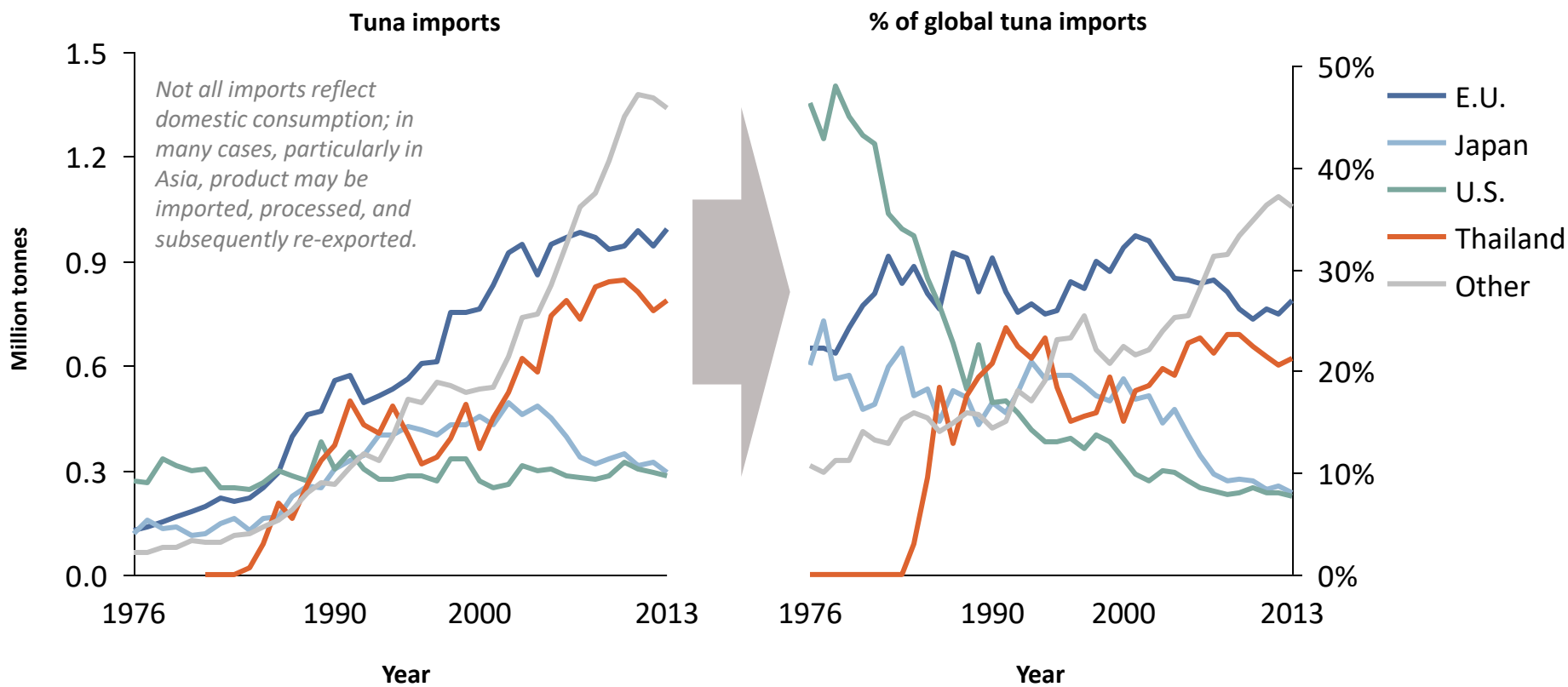
## Commodity of particular interest – salmonids

**Salmon trade has continued to skyrocket, driven primarily by increased aquaculture production.** E.U. imports increased dramatically between 2003 and 2013, driven by intra-European trade of Norwegian farmed salmon, but the E.U.'s share of imports has remained stable around 50% as global growth has kept pace. Together the E.U., the U.S., and Japan accounted for 68% of global imports in 2013. Japan's share of has dropped precipitously as the growth of imports into the E.U., Russia, and China have outpaced the growth of Japanese imports.



Commodity of particular interest – tuna\*

**Tuna imports to countries outside the U.S., the E.U., and Japan have more than doubled in the two decades leading up to 2013.** E.U. imports also grew, though less dramatically, while imports into the U.S. and Japan have remained relatively steady and even declined in recent years. The E.U., Japan, and the U.S. accounted for only 44% of imports in 2013, down from 93% of imports in 1976. This likely reflects the rise of processing and re-exporting of tuna in countries like Thailand and China.



\*Included bonitos and billfish  
Source: FAO, FishStat.

# Business relationships

## Key takeaways

- In North America and Europe, the majority of top retailers have sustainable seafood commitments to wild-caught seafood.
- Due to substantial progress, Greenpeace issued U.S. Retailers their final “State of the Oceans” scorecard. Greenpeace is now shifting to a Food Service Sustainability Scorecard, a sector with much greater room for improvement.
- Fast food chains that had already made sustainable seafood commitments have continued to honor them, though there have been no new partnerships in the fast food sector since 2015.
- NGO partners continue to make progress developing commitments with food-service distributors in the United States, but progress has been slower with pet food producers and hotels.

### BUSINESS RELATIONSHIPS & SUPPLY CHAIN ENGAGEMENT

Influential businesses operationalize their commitments to sustainable seafood.

### CONDITIONS FOR BUSINESS CHANGE

Influential businesses have the information, tools, and motivation to engage on sustainable seafood, based partly on consumer awareness and NGO partnership.

advocacy and corporate support help drive improved government regulations and enforcement

considered an area of NGO focus.

Corporate- NGO partnerships  
Greenpeace’s scorecard data

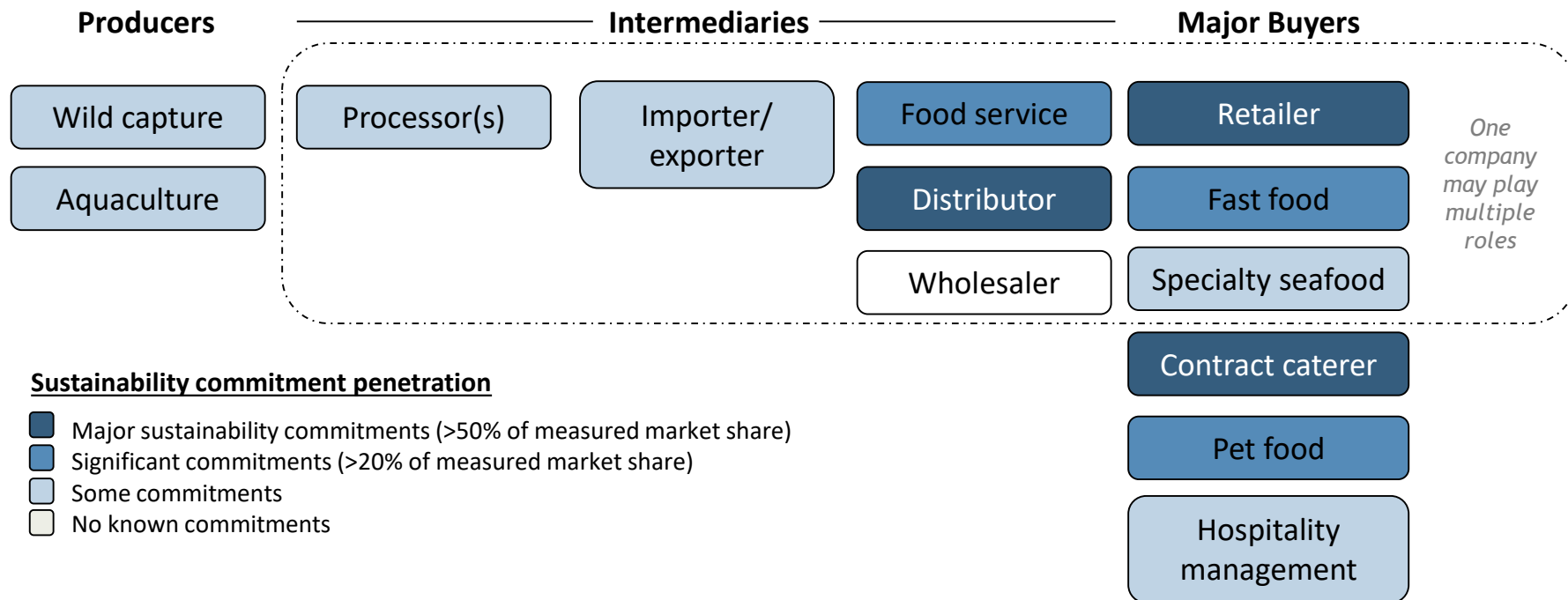
Media and literature penetration  
Industry event attendance  
U.S. seafood consumption

Consumer interest and preferences  
Enabling businesses and initiatives

## BUSINESS RELATIONSHIPS

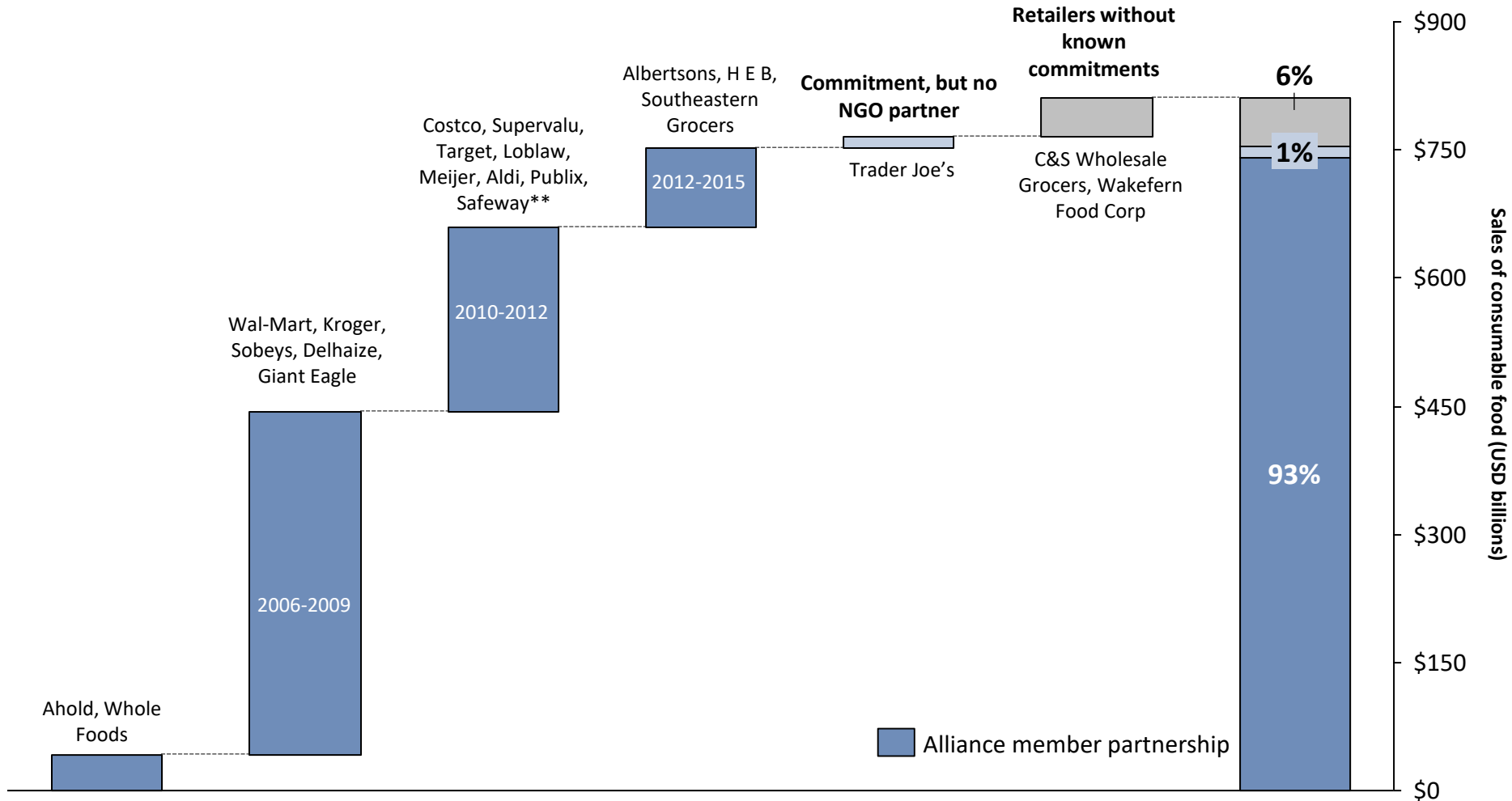
The majority of new sustainable seafood commitments are not from companies with leading market shares, as many have already made commitments

**Most sustainable seafood commitments are made by retailers in the U.S. and E.U.,** though commitments exist across almost every segment of the supply chain. Since 2015, two major U.S. retailers and a major food service distributor made new commitments, along with more than 50 more new commitments from companies with smaller market shares. These commitments are internationally dispersed and some are novel (such as those from meal kit companies). Though commitments take many forms, the most common include: 1) pledges to source from fisheries that are either certified (MSC, ASC, GAA, etc.) or engaged in FIPs, or 2) commitments to traceability and chain of custody through partnership with NGOs. The following slides focus on wild-seafood commitments involving partnerships with NGOs members of the Conservation Alliance.



# Top 25\* North American retailers' sustainable seafood commitments have leveled off, with more than 90% of the market share engaged

Top 25\* North American Retailers – Total Sales



Note: 'Pre-2006,' '2006-2009,' '2010-2012,' and '2012-2015' refer to the year in which the retailer partnered with a Conservation Alliance member.

\*7-Eleven, CVS Health, Dollar General, and Walgreen Co were removed due to lack of seafood sales.

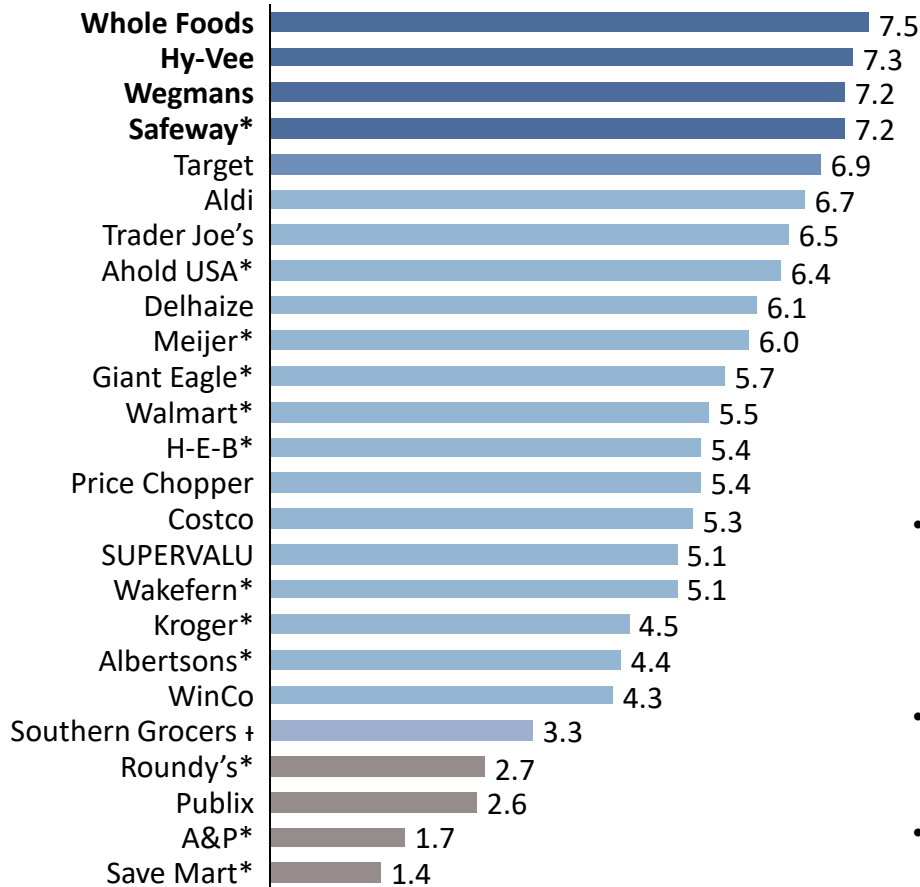
\*\*Safeway partnered with FishWise in 2010 and merged with Albertsons in 2015.

Source: Supermarket News, press releases, and communications with Conservation Alliance member organizations.

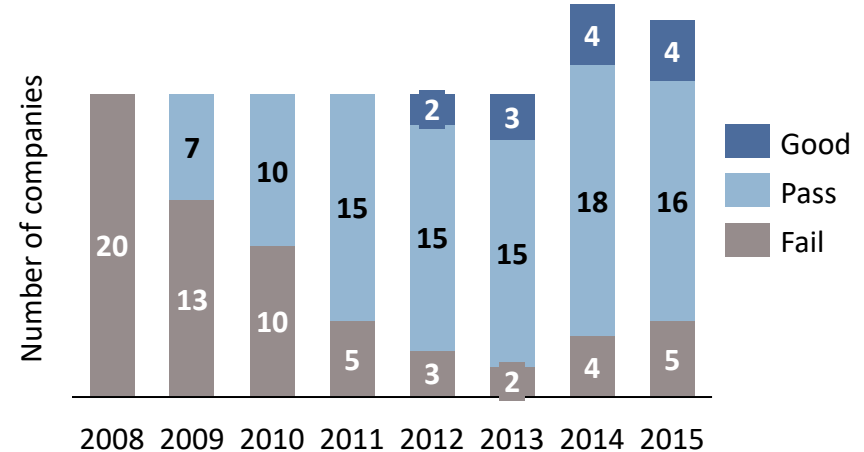
## BUSINESS RELATIONSHIPS

Retailer sustainability scores assigned by Greenpeace have improved significantly year after year; retailer scorecards will be discontinued

### 2015 Greenpeace Seafood Retailer Scorecard



### Recent trends in Greenpeace retailer ratings



- The Greenpeace Supermarket Seafood Sustainability Scorecard rates seafood retailers on whether they have a sustainable seafood sourcing policy, sustainability initiatives, labeling and transparency, and/or sales of “red list” seafood.
- Cumulative scores have improved significantly since 2008, with 20 out of 25 retailers receiving a passing score in 2015.
- Due to this progress among retailers, Greenpeace is shifting to a food service sustainability scorecard, which it started in 2016.

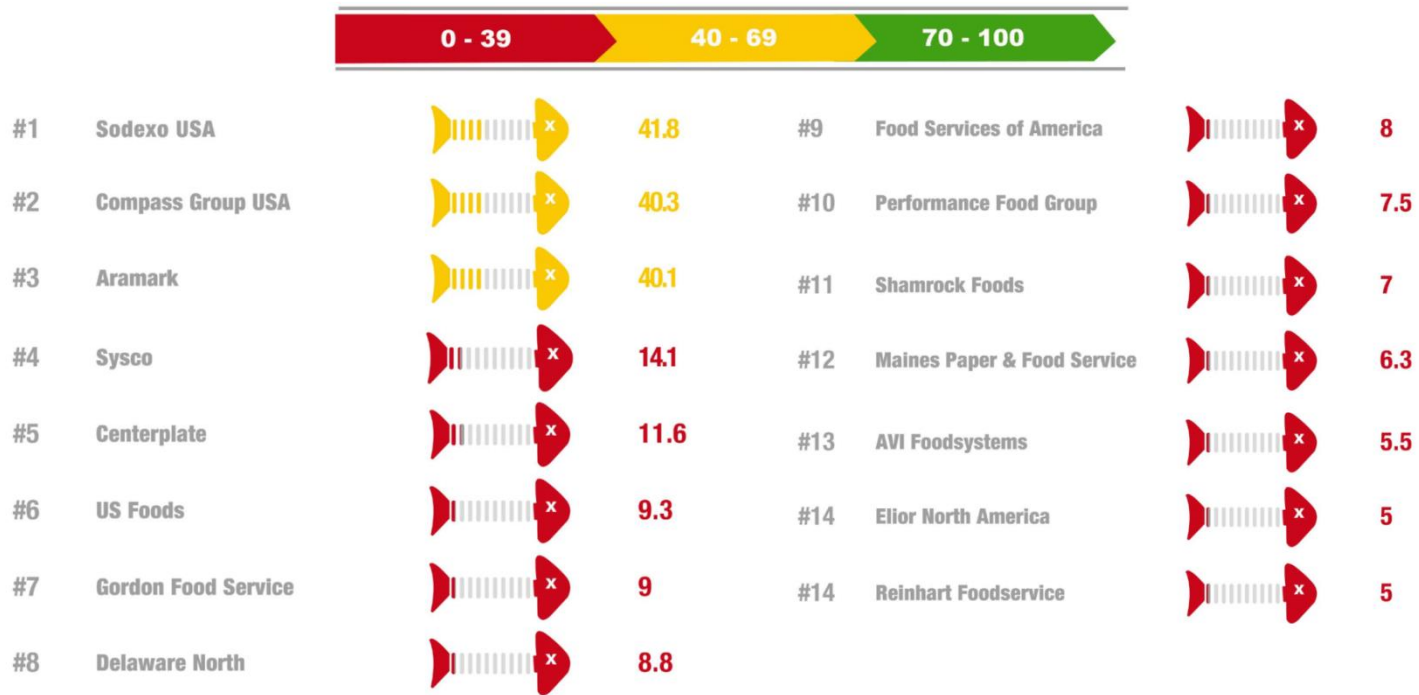
\* Denotes parent company with multiple store banners.

† Not included in previous years' reports.

## BUSINESS RELATIONSHIPS

# Greenpeace moves to inaugural year of Food Service Sustainability Scorecard, with only three companies receiving a passing score

**Greenpeace gave most top U.S. food service companies a failing score on their seafood sustainability efforts.** The U.S. food service industry has annual sales exceeding \$700 billion, representing approximately half of food-away-from-home spending each day. Its remarkable impact on the global environment is relatively unknown to the public, as the companies operate behind the scenes providing meals for large companies and institutions. Greenpeace seeks to draw attention to the industry’s minimal efforts with respect to sustainable seafood.

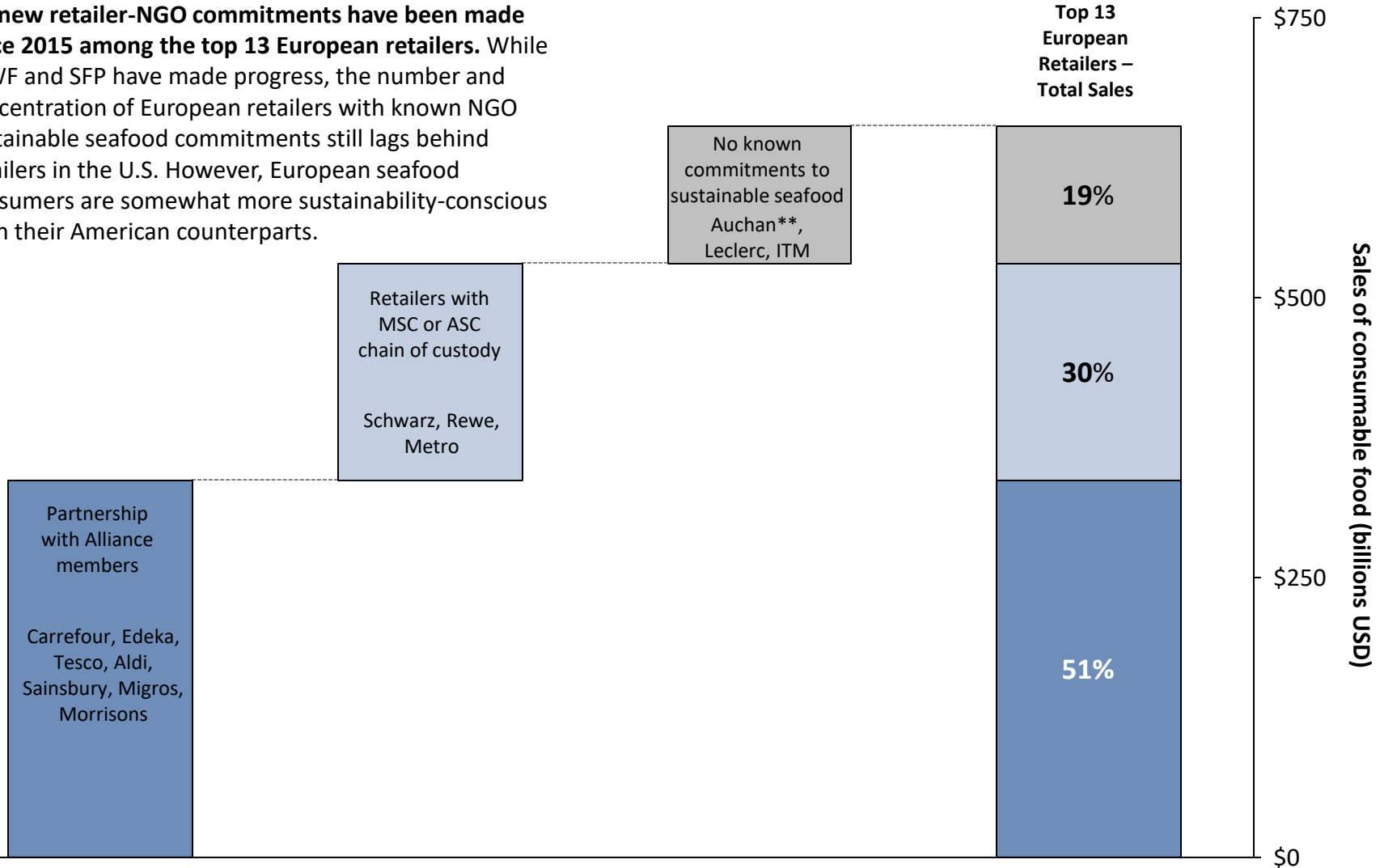


Surveys were scored independently and evaluated consistently across companies. After extensive review of independent findings among the scoring team, companies received an overall score (weighted average of the five criteria) agreed upon by the scoring team. Each company profile includes its overall score and score for each of the five criteria (i.e., policy, sourcing, advocacy, traceability and transparency, inventory) on a hundred-point scale, where below 40 is a failing score, 40 to 69.9 is a passing score, and above 70 is a leading score.

## BUSINESS RELATIONSHIPS

Of the top 13 European retailers,\* 10 have made commitments to sustainable seafood, mostly through NGO partnerships

**No new retailer-NGO commitments have been made since 2015 among the top 13 European retailers.** While WWF and SFP have made progress, the number and concentration of European retailers with known NGO sustainable seafood commitments still lags behind retailers in the U.S. However, European seafood consumers are somewhat more sustainability-conscious than their American counterparts.



\*13 of the top 15 European retailers sell seafood products.

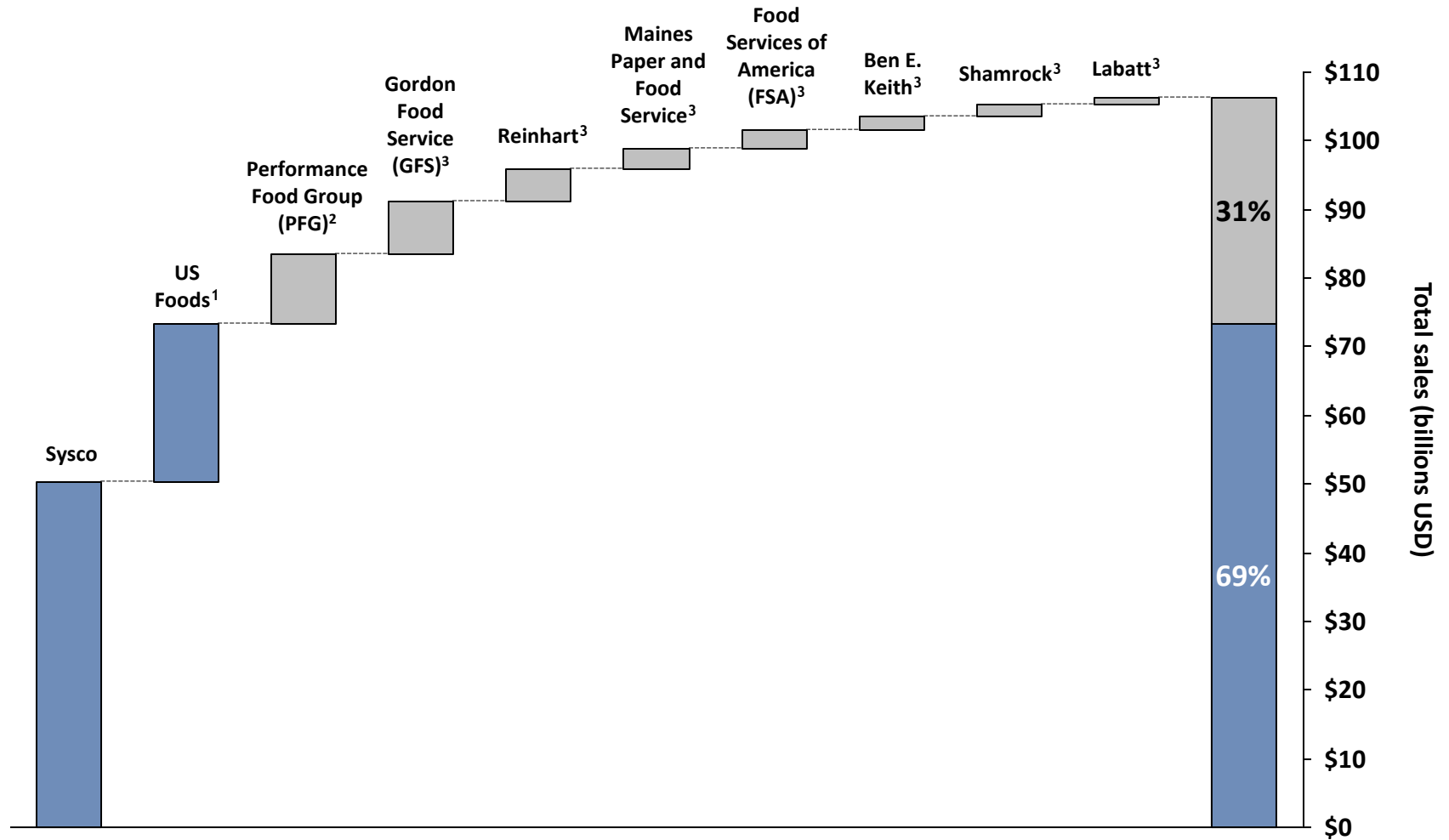
\*\*SFP is partnered with Spanish retailer Alcampo, owned by Auchan.

Source: Communication with WWF and SFP; MSC.org; company websites; <http://www.retail-index.com/>.



## BUSINESS RELATIONSHIPS

Sysco and US Foods, the largest North American food service distributors by total sales, have made sustainable seafood commitments



Note: This chart has been updated with public financial data from the SEC's EDGAR database, which was only available for Sysco and US Foods. Due to the lack of public industry data, the composition of the top ten companies in the industry may have changed from what is shown.

1. New commitment with SFP as of 2016.

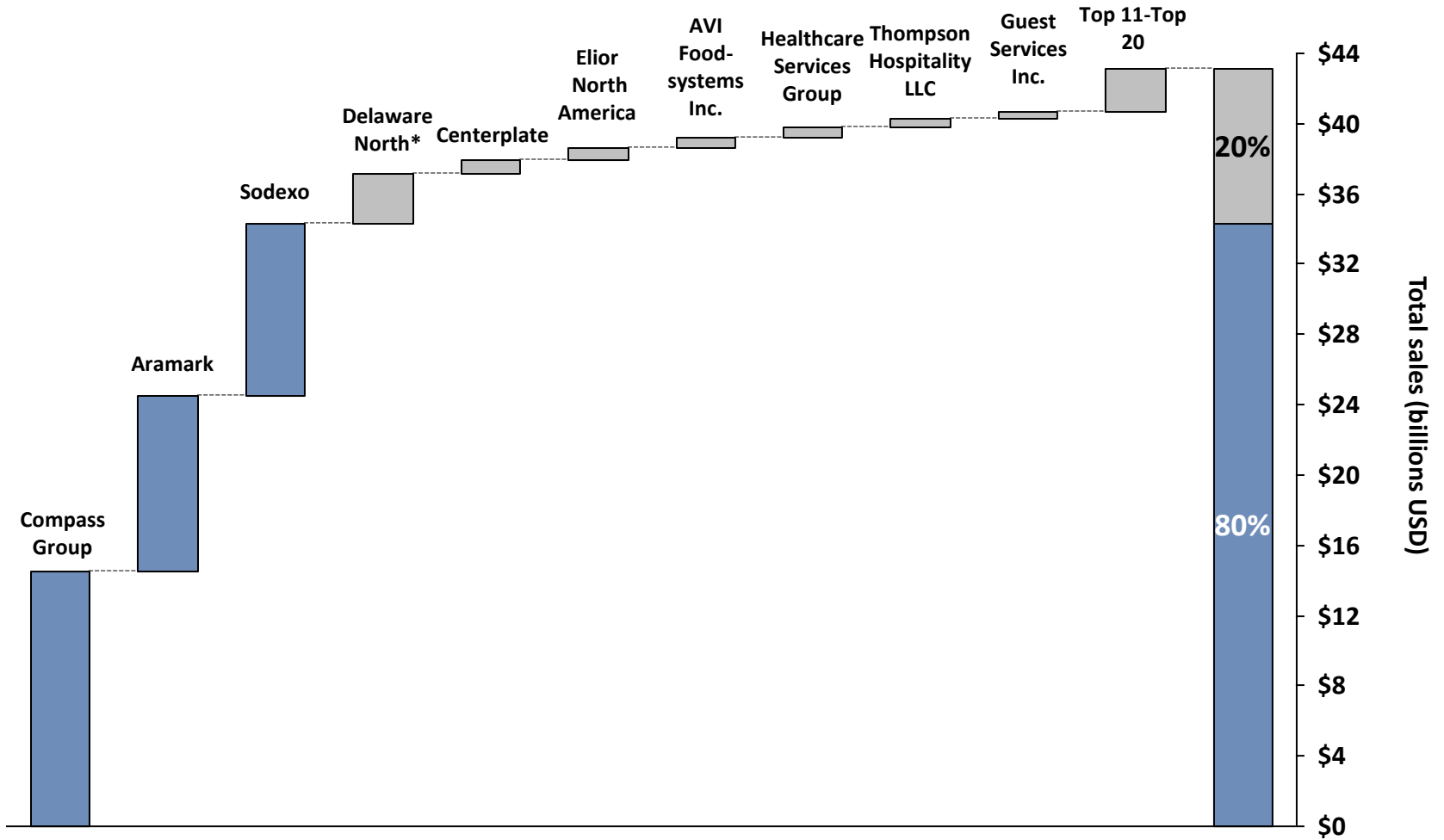
2. New sales information not available; sales as of 2013.

3. Companies are not publicly traded; sales as of 2013.

Source: Communication with Conservation Alliance member organizations.

## BUSINESS RELATIONSHIPS

Of the top 20 U.S. contract catering companies, the three largest have made commitments



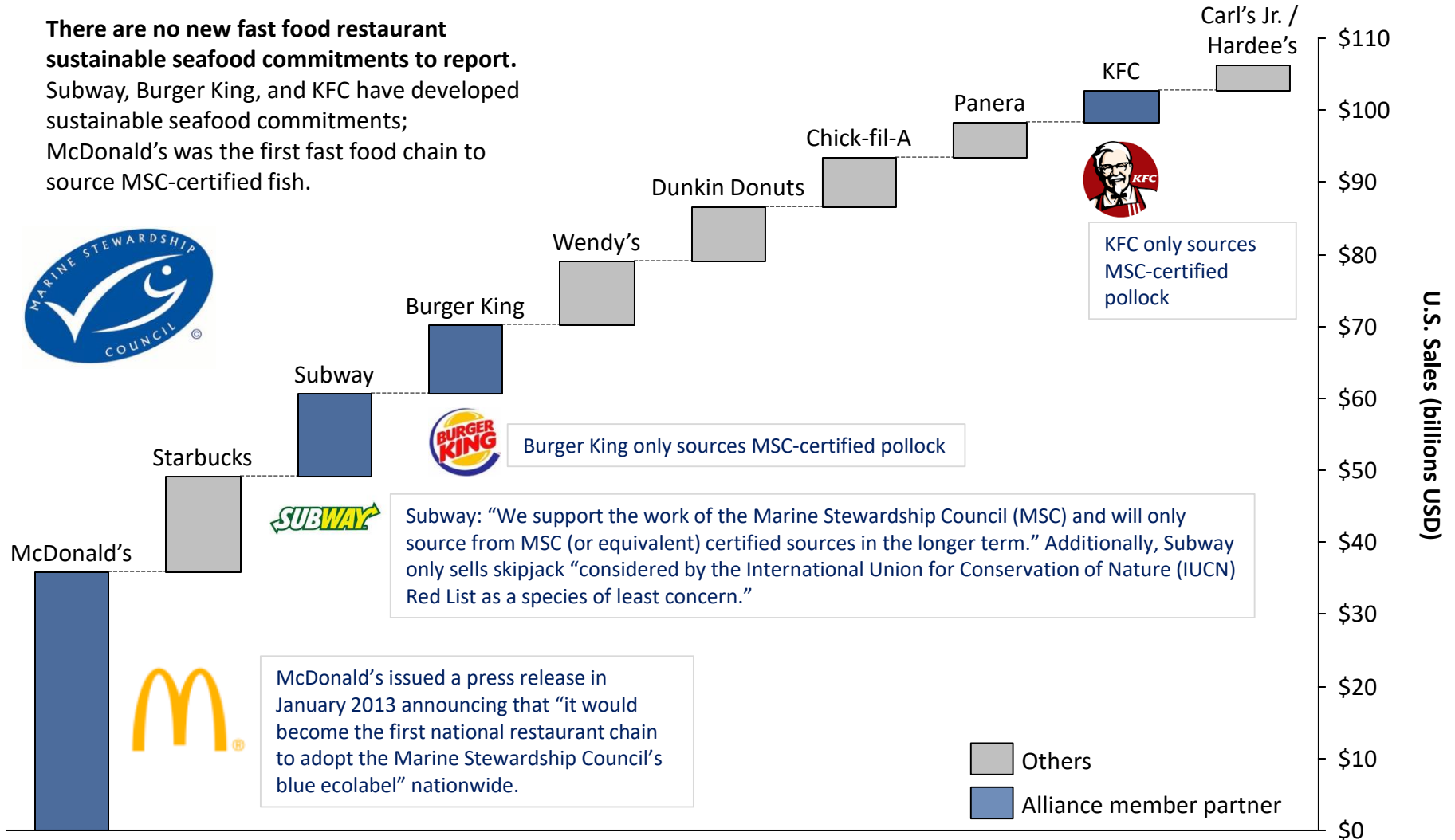
\*Delaware North cites MBA's SFW program as helping guide its procurement decisions.  
Source: Communication with Conservation Alliance member organizations.

## BUSINESS RELATIONSHIPS

# No new top-10 U.S. fast food restaurants\* by sales have recently developed sustainable seafood commitments

**There are no new fast food restaurant sustainable seafood commitments to report.**

Subway, Burger King, and KFC have developed sustainable seafood commitments; McDonald's was the first fast food chain to source MSC-certified fish.

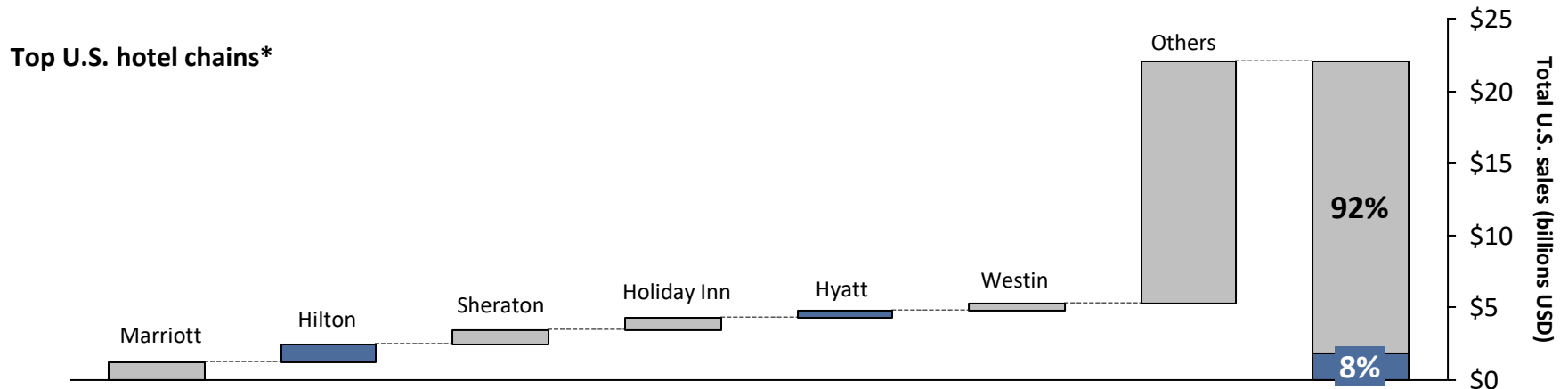
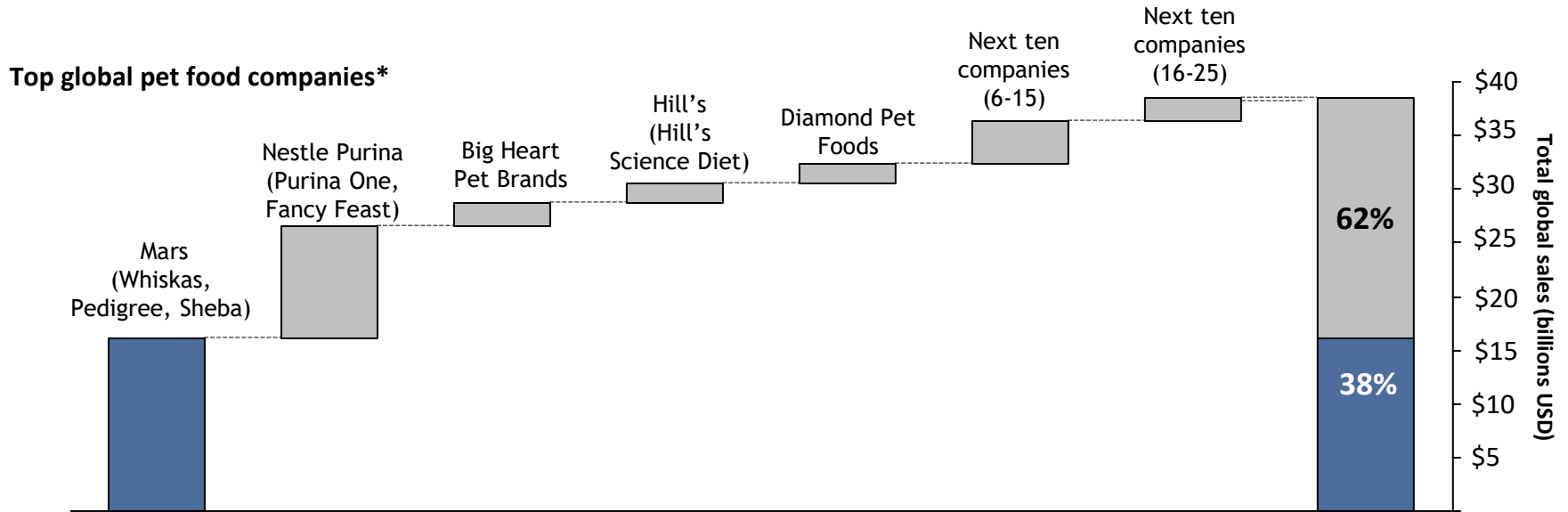


U.S. Sales (billions USD)

\*10 of the top 15 U.S. fast food restaurants sell seafood products at all or select locations.  
 Source: Communication with Conservation Alliance member organizations; company websites.

## BUSINESS RELATIONSHIPS

Among other major seafood buyers, major pet food companies and hotels are lacking in new sustainability commitments



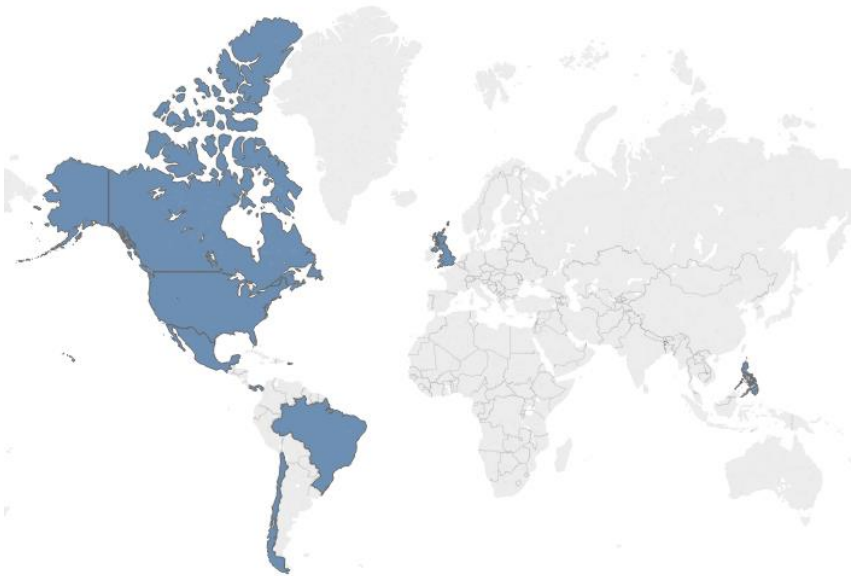
\*Sales as of 2013  
Source: Communication with Conservation Alliance member organizations.

## BUSINESS RELATIONSHIPS

Sea Pact continues to build sustainability into supply chains and provides an example of how precompetitive collaboration can create positive impact

**Sea Pact, a group of North American seafood companies, pool financial resources together to fund project grants to improve sustainability up the supply chain,** working with FishWise, SFP, and Ocean Outcomes to select projects. So far, Sea Pact has provided over US \$340,000 in direct support to 13 projects in 8 countries, through 17 grants.

### Sea Pact grantees span a range of geographies



*Grantee recipients include organizations in the United States, Canada, the United Kingdom, Brazil, Mexico, the Philippines, Chile, and Panama*

### Types of projects funded:



- Gear or farm improvements
- Fisheries management
- Wild stock enhancement
- Species research and data collection
- Fisheries conservation
- Fishery habitat restoration
- Regional aquaculture management
- Aquaculture improvement projects
- Fishery improvement projects
- Technology
- Communication/Education

## BUSINESS RELATIONSHIPS

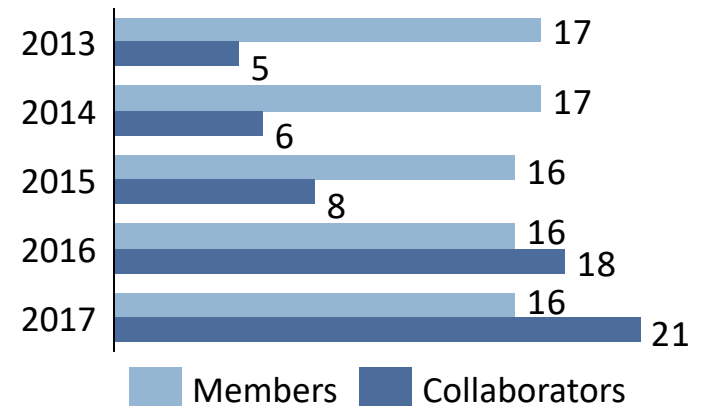
# Conservation Alliance for Seafood Solutions continues to expand its coalition of environmental NGOs promoting seafood sustainability

**The Conservation Alliance for Seafood Solutions (Alliance) connects 37 leading conservation groups, from the U.S. and now Japan, Mexico and Europe, to help businesses craft and execute meaningful and measurable sustainable seafood commitments** and to share expertise on important sustainable seafood issues. The Alliance “envisions vibrant, resilient ocean and freshwater ecosystems that contribute to improved livelihoods and food security.”

### Progress:

- Ratified a new Common Vision for Sustainable Seafood in 2016, with key updates on social issues, traceability, and improvement projects.
- Hosted two standing meetings each year: the Strategy Meeting and the Annual Meeting.
- Worked with companies within the North American grocery and food service markets to make commitments to sell sustainable seafood.
- In 2016, the Conservation Alliance hired its first Executive Director.

### Alliance growth:



### Alliance Goals 2016-2020:

Deepen and successfully implement sustainable seafood commitments of North American major buyers from retail, restaurant, food service, and supplier/distributor sectors.

Use the buying power of North American companies to support improvements in global fishing and aquaculture and supply chain practice and management.

Create an enabling environment for Alliance members and collaborators to connect and coordinate to maximize their impact.

## BUSINESS RELATIONSHIPS

Conservation Alliance for Seafood Solutions continues to expand its coalition of environmental NGOs promoting seafood sustainability

### Members:



### Collaborators:



# Creating conditions for business change

## Key takeaways

- Media coverage of IUU fishing has grown significantly in recent years, while FIP coverage remained limited. User searches for IUU have also increased relative to other sustainable seafood terms since the mainstream media began covering the issue.
- The 2016 SeaWeb Seafood Summit in Malta drew increased attendance from internationals and participants working in science, government, or academia.
- MSC research into consumer behavior suggests that, globally, consumers prioritize sustainability over both price and brand when buying seafood, though in the US health is a bigger driver of purchasing decisions.
- U.S. seafood consumption per capita has remained stable, although consumer preferences are shifting away from canned tuna and tilapia toward salmon and pangasius.
- Momentum toward better traceability has continued; more than two-dozen NGOs are promoting traceability initiatives and essential traceability technologies are being developed.

### CONDITIONS FOR BUSINESS CHANGE

Influential businesses have the information, tools, and motivation to engage on sustainable seafood, based partly on consumer awareness and NGO partnerships.

Media and literature penetration

Industry event attendance

U.S. seafood consumption

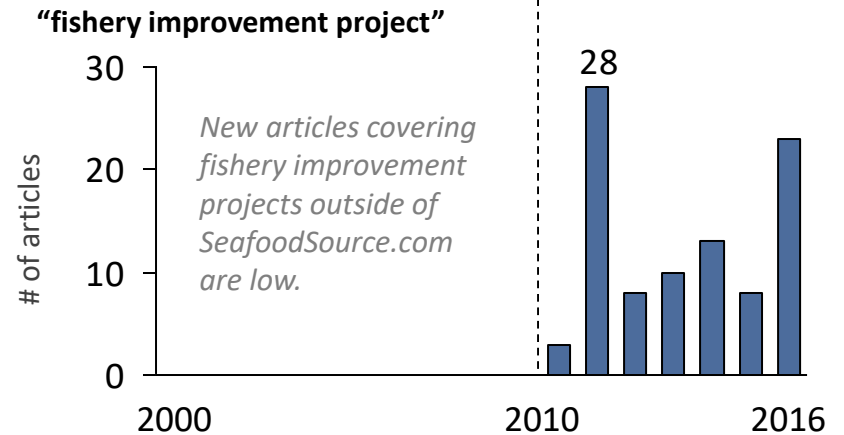
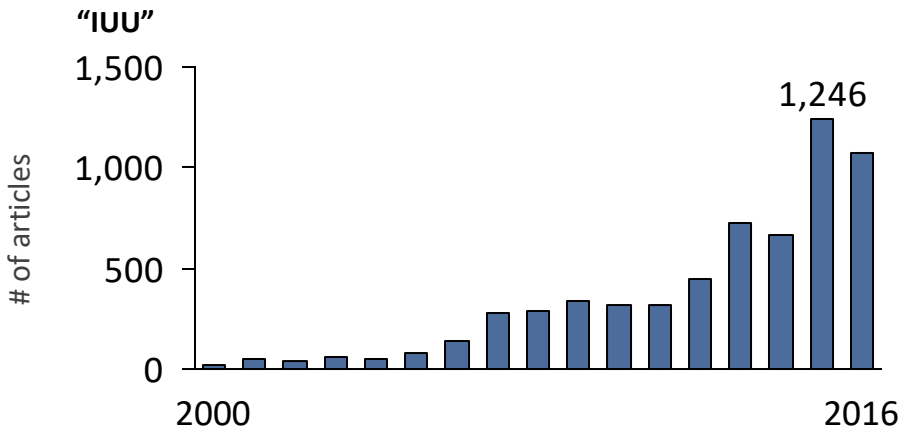
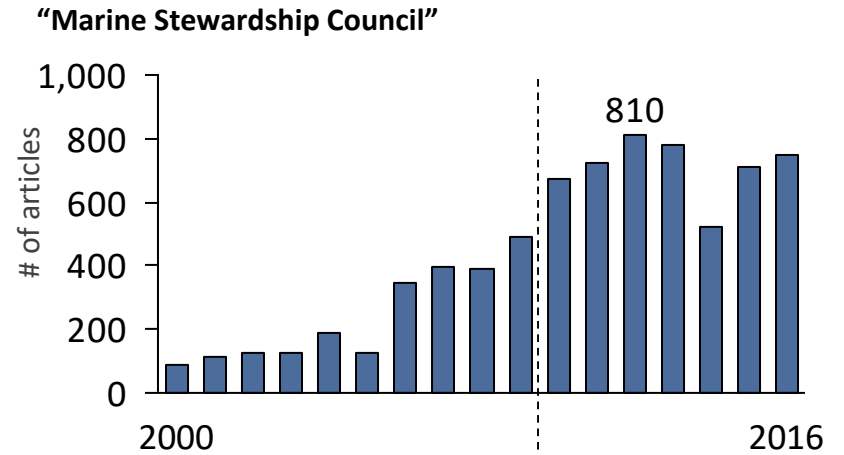
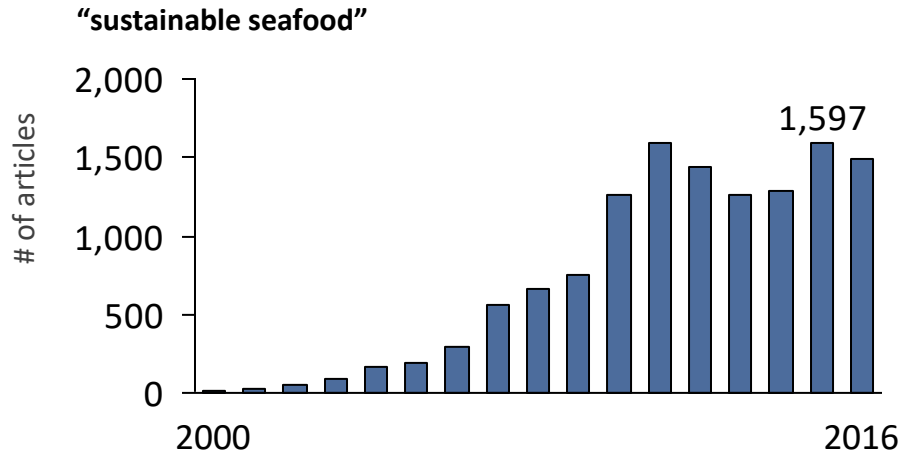
Consumer interest and preferences

Enabling businesses and initiatives



## CREATING CONDITIONS FOR BUSINESS CHANGE: MEDIA

Mainstream media coverage of sustainable seafood and MSC has stabilized, while IUU coverage has grown and coverage of FIPs remains low

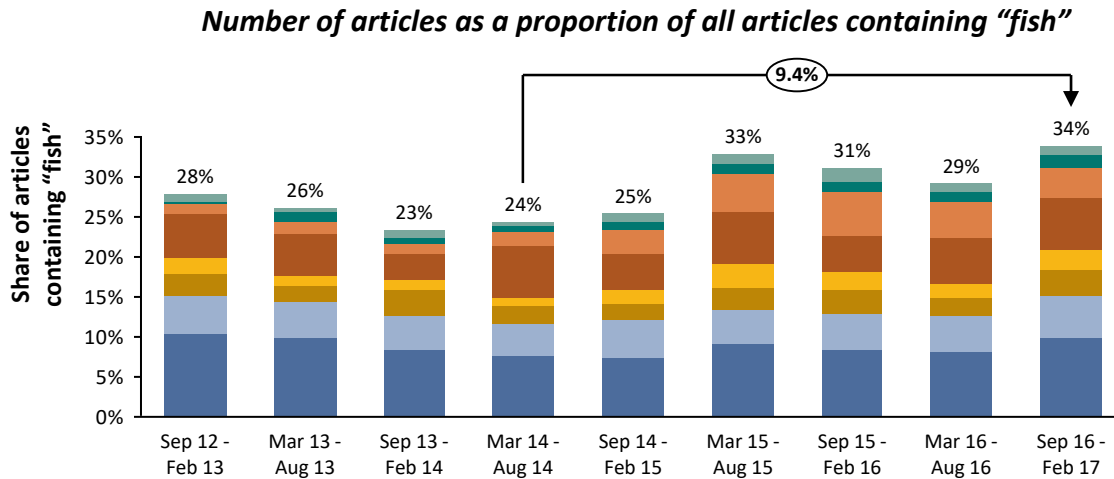
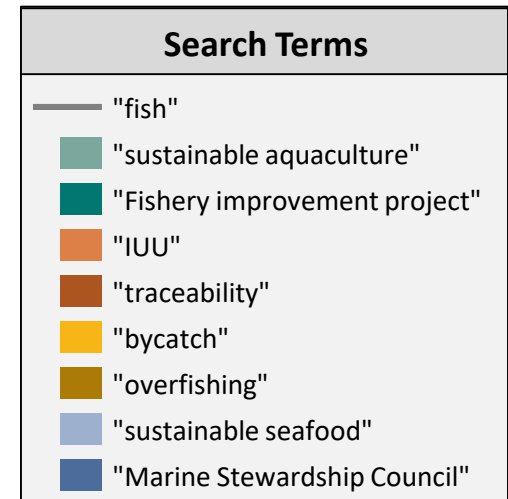
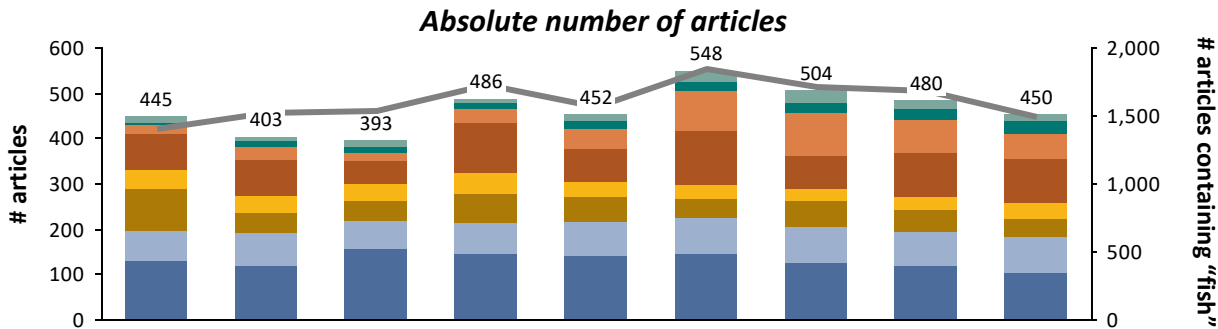


# CREATING CONDITIONS FOR BUSINESS CHANGE: MEDIA

## Sustainability issues are receiving an increased share of coverage on IntraFish.com (a seafood industry website)

Starting in 2015, the share of IntraFish.com articles containing terms related to sustainable seafood increased. Since then, levels have remained higher than in previous years. The trend has been driven primarily by an increased number of articles related to IUU and bycatch.

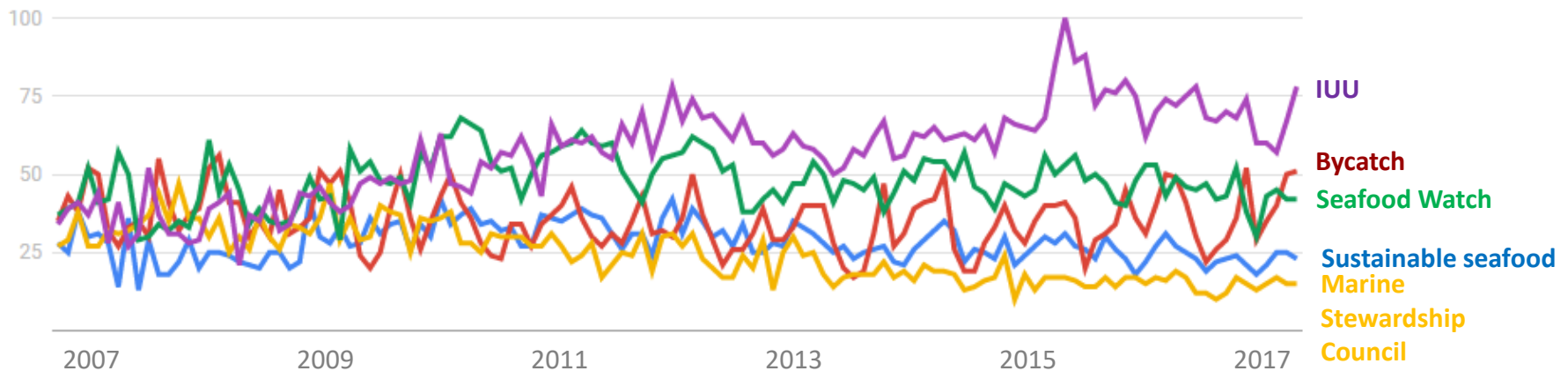
### Articles published by [www.IntraFish.com](http://www.IntraFish.com) during each 6-month period



## Consumer searches around sustainable seafood vary substantially

Google Trends compares the relative volume of search traffic between terms. The results below suggest that interest in **sustainable seafood** and in two of the movement’s longstanding institutions (**Seafood Watch** and **MSC**) is relatively stable. However, interest in specific issues fluctuates over time. Searches for **Bycatch** seem to reflect regular or seasonal fluctuations. Searches for **IUU** have increased in recent years, spiking during the height of media coverage for the issue.

Google Trends: Interest Over Time



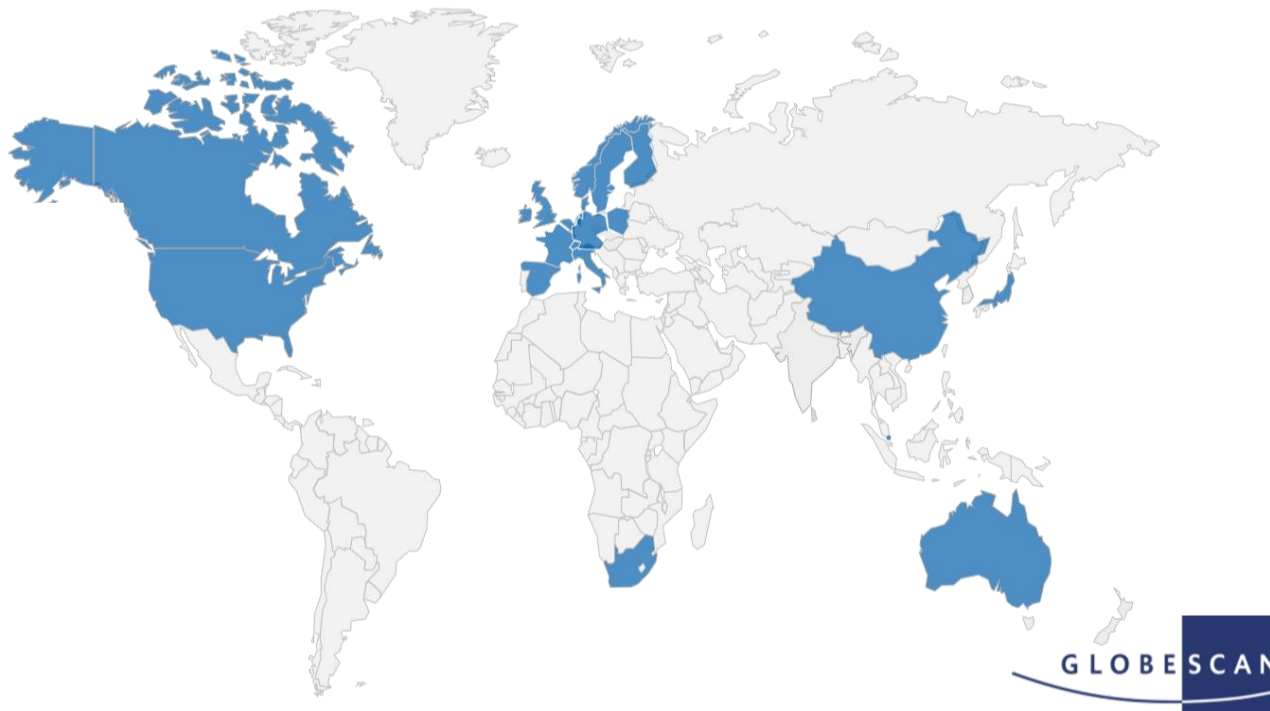
*Note: Numbers represent search interest relative to the highest point on the chart for the set of terms. A value of 100 represents peak popularity. A value of 50 means that the term is half as popular. Likewise, a score of 0 means the term was less than 1% as popular as at the peak.*

## CREATING CONDITIONS FOR BUSINESS CHANGE: CONSUMERS

# MSC Consumer Perceptions Study Results: Seafood consumers around the world state a preference for sustainable seafood

**MSC commissioned GlobeScan to conduct a global research study into consumer perceptions, surveying more than 20,000 consumers in 21 countries.<sup>1</sup> Findings suggest that while seafood consumers<sup>2</sup> generally support ecolabeling and certification efforts, they do not necessarily notice them.**

- The survey found that sustainability is an important aspect of seafood purchasing decisions in international markets.
- In the United States, health was found to be a bigger driver of purchasing decisions than sustainability.



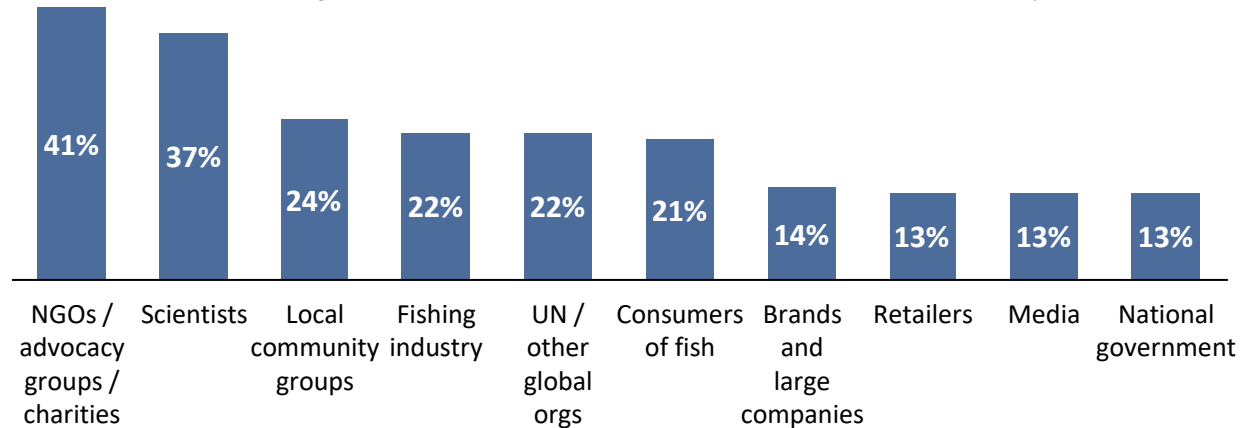
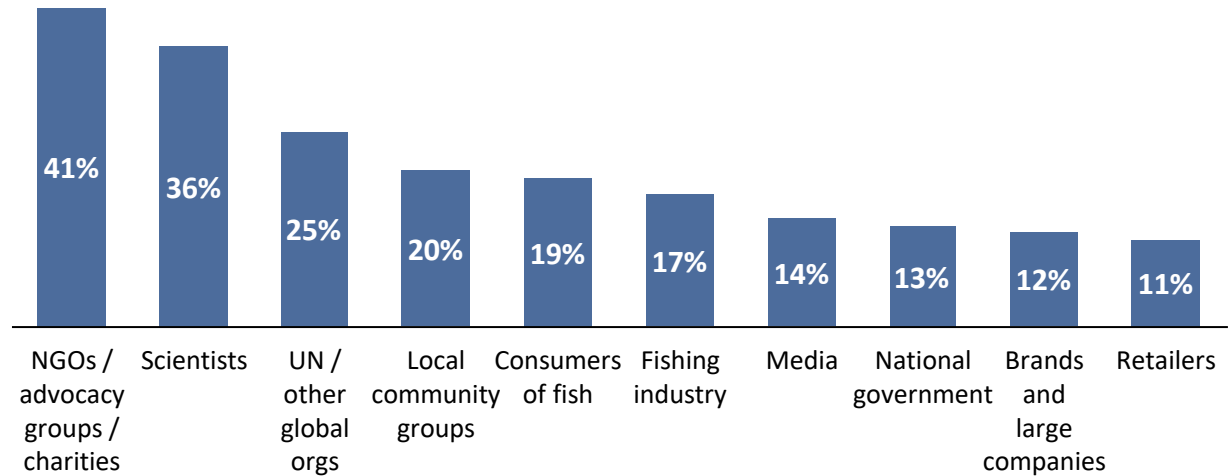
<sup>1</sup> The 21 countries are Australia, Austria, Belgium, Canada, China, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Poland, Singapore, South Africa, Spain, Sweden, Switzerland, UK and USA.

<sup>2</sup> Of the 20,000 consumers surveyed, 16,876 were found to be "seafood consumers," or those living in a household where someone had purchased seafood in the last two months.

# CREATING CONDITIONS FOR BUSINESS CHANGE: CONSUMERS

## MSC Consumer Perceptions Study Results: Global and U.S. seafood consumers view NGOs and scientists as the biggest protectors of oceans

Seafood consumers globally and in the United States view NGOs and scientists as contributing the most to the protection of the oceans, while retailers, larger companies, and government are viewed as lagging behind.



\*Global base: n=16,876; U.S. base: n=2063; Question: How well do you think the following institutions are contributing to protecting the ocean environment? Please use a scale from 1-7, where 1 is "Not very well" and 7 is "Very well."

Source: MSC Consumer Insights, 2016.

# CREATING CONDITIONS FOR BUSINESS CHANGE: CONSUMERS

## MSC Consumer Perceptions Study Results: Sustainability is a stronger stated motivator than price in seafood purchases globally, but not in the U.S.

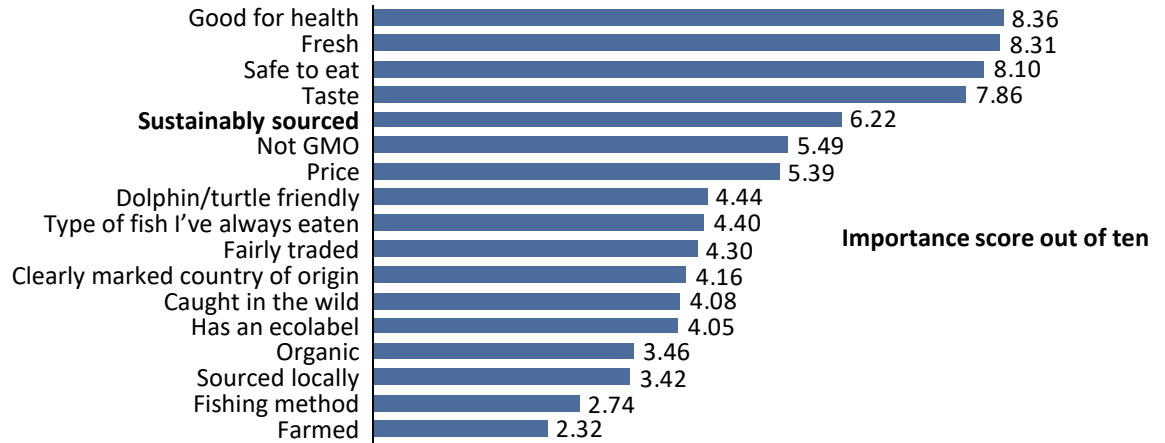
**Globally, seafood consumers report seeking out environmentally friendly seafood over price and brand. In the United States, seafood consumers say they care about sustainably sourced seafood, but often associate sustainability with a positive health impact, rather than positive environmental impact.**



Most important



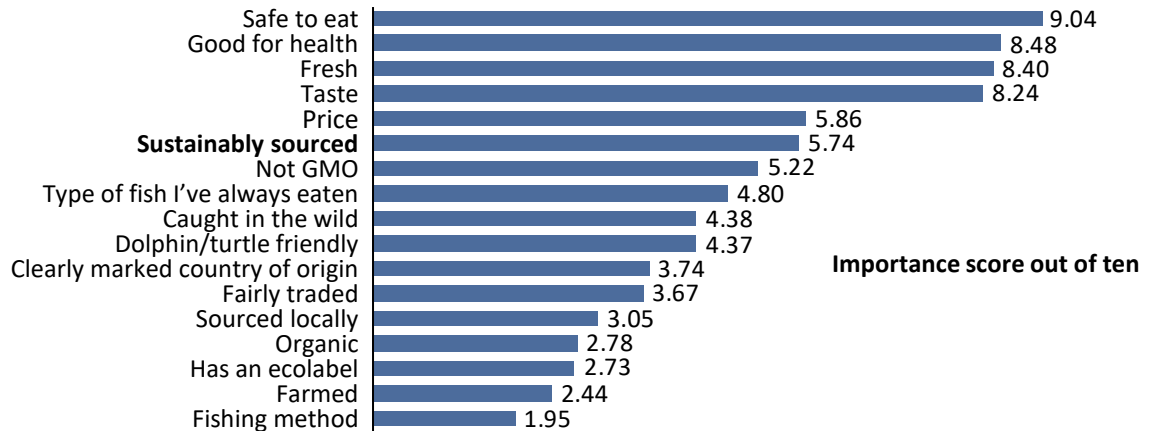
Least important



Most important



Least important



\*Global base: n=16,876; U.S. base: n=2063; Question: Thinking about your recent seafood purchases, which of the following considerations were the most important and which were the least important?.

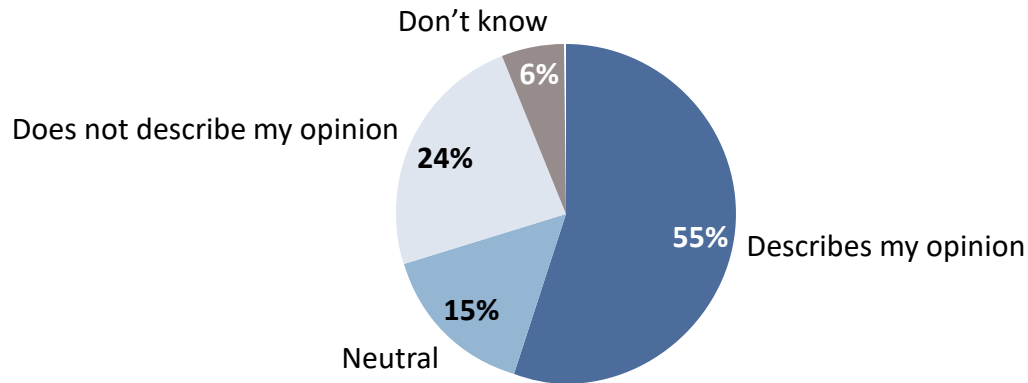
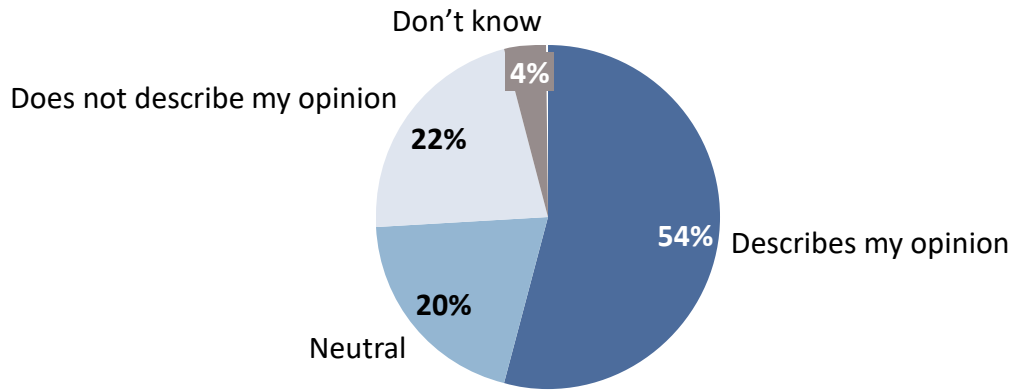
Source: MSC Consumer Insights, 2016.

## CREATING CONDITIONS FOR BUSINESS CHANGE: CONSUMERS

# MSC Consumer Perceptions Study Results: Globally and in the U.S., seafood consumers report willingness to pay more for certified sustainable fish

**Over half of seafood consumers, both globally and in the United States, say they are willing to pay more for sustainable seafood.**

“I am prepared to pay more for fish and seafood products which come from a certified sustainable fishery”



\*Global base: n=16,876; U.S. base: n=2063; Question: How well does the following statement describe your opinion – “I am prepared to pay more for fish and seafood products which come from a certified sustainable fishery”? Please use a scale from 1-7 where 1 means “Does not describe my opinion very well” and 7 means “Describes my opinion very well.”

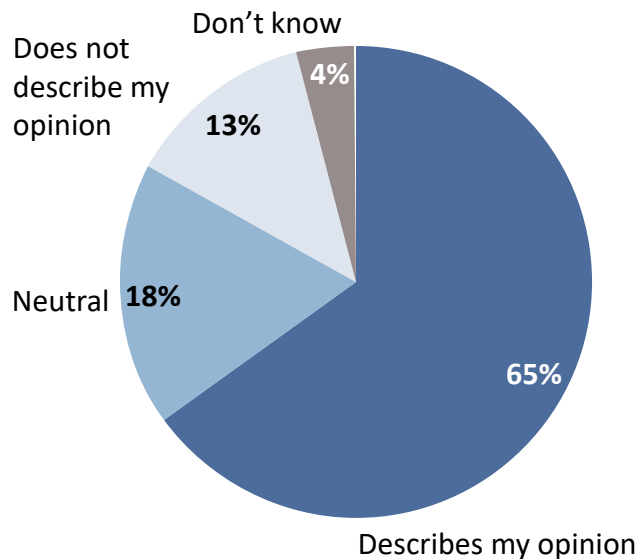
Source: MSC Consumer Insights, 2016.

# CREATING CONDITIONS FOR BUSINESS CHANGE: CONSUMERS

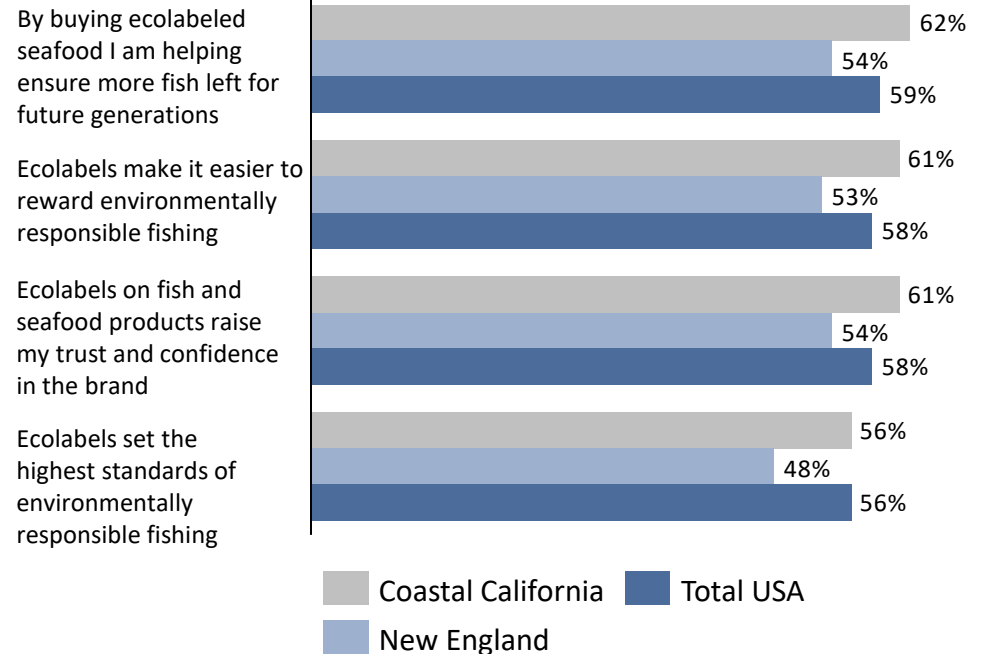
## MSC Consumer Perceptions Study Results: U.S. seafood consumers expect independent certification, and coastal Californians perceive highest benefits

**The majority of seafood consumers in the United States believe there is a need for brands to independently verify their sustainability claims.** However, the perceived benefits of ecolabeling are lower in the United States than globally.

**U.S. demand for independent certification:**  
 “Supermarkets’ and brands’ claims about sustainability and environment need to be clearly labeled by an independent organization”



### Benefits of ecolabeled fish, by region



\*Global base: n=16,876; U.S. base: n=2063; Question: How well does the following statement describe your opinion - “Supermarkets’ and brands’ claims about sustainability and environment need to be clearly labeled by an independent organization”? Please use a scale from 1-7 where 1 means “Does not describe my opinion very well” and 7 means “Describes my opinion very well.”  
 Source: MSC Consumer Insights, 2016.

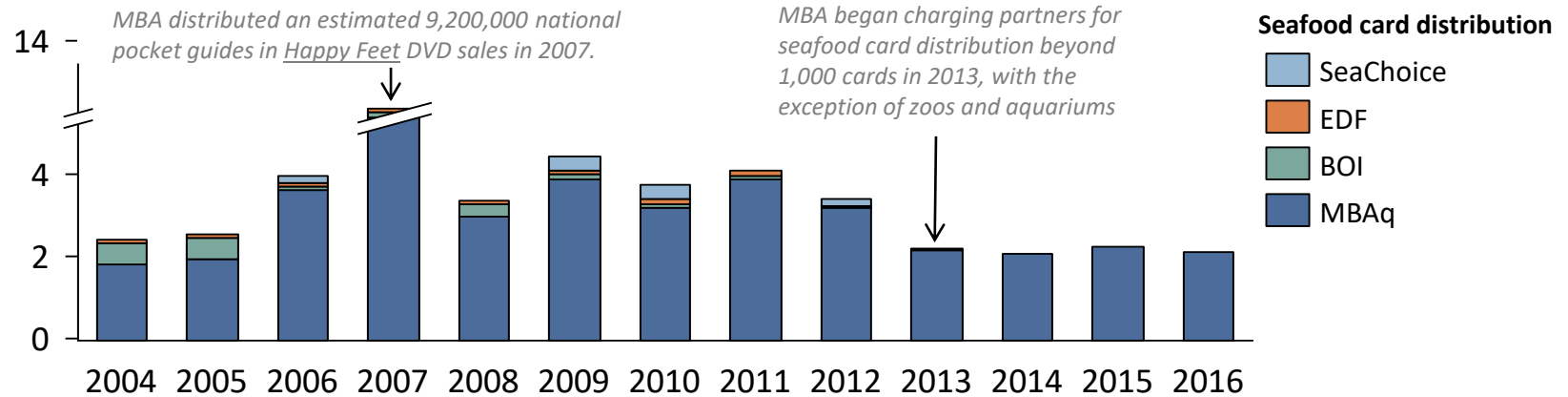


## CREATING CONDITIONS FOR BUSINESS CHANGE: CONSUMERS

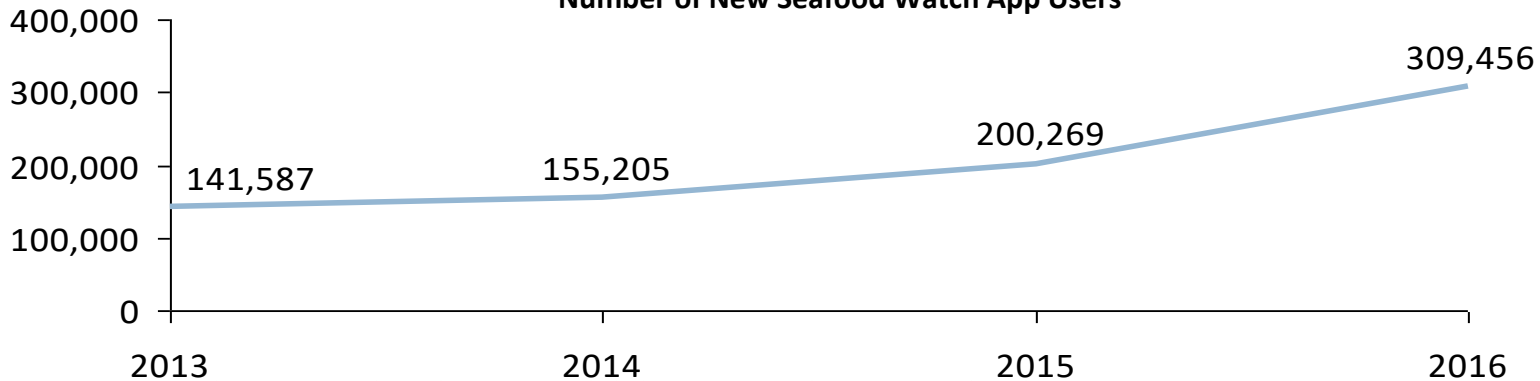
Though seafood card distribution has declined in recent years, use of the Seafood Watch phone application has continued to grow

**Monterey Bay Aquarium is the primary source of North American seafood cards.** EDF and Blue Ocean Institute (BOI) ceased seafood card printing and distribution in 2012. Smart phone application use is on the rise, with over 300,000 new Seafood Watch app users in 2016. Outside of North America, WWF has created over 25 country-specific seafood guides\* for consumers that are also available as phone applications.

Number of seafood cards distributed



Number of New Seafood Watch App Users\*\*



\*For more information, please see [http://wwf.panda.org/how\\_you\\_can\\_help/live\\_green/out\\_shopping/seafood\\_guides/](http://wwf.panda.org/how_you_can_help/live_green/out_shopping/seafood_guides/)

\*\*The application is currently available for both iPhone and Android users.

Source: Communication with distributing organizations.

## CREATING CONDITIONS FOR BUSINESS CHANGE: CONSUMERS

One in five seafood samples tested worldwide are mislabeled. This is true at every sector of the supply chain, although results vary region to region

**A 2016 Oceana study found widespread mislabeling on every continent except Antarctica.** Asian catfish, hake, and escolar were the three species most commonly substituted for higher-value fish.

- **58%** of the seafood used in substitutions were found to **pose health risks** to consumers.
- **65%** of the studies reviewed by Oceana included clear evidence of **economically motivated** mislabeling.

### Global Examples of seafood mislabeling



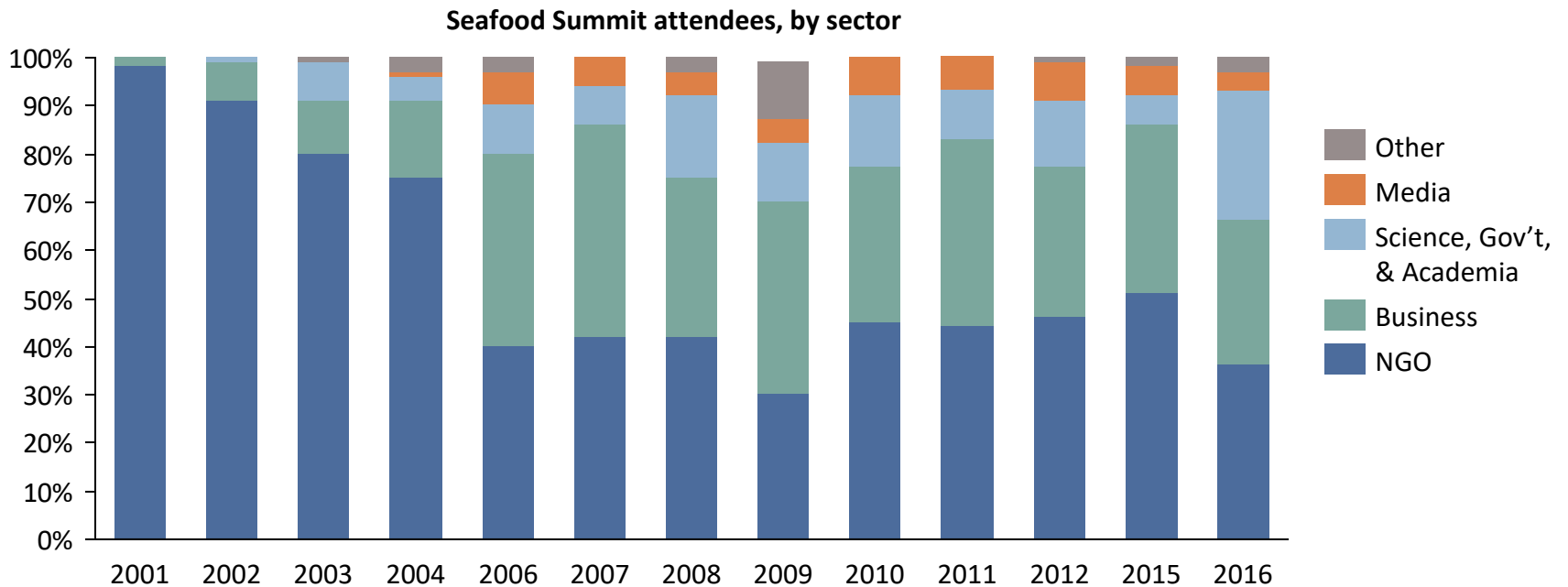
## CREATING CONDITIONS FOR BUSINESS CHANGE: EVENTS

The Seafood Summit increased its proportion of international attendees, primary decisionmakers, and “science, government, and academia” representatives

**The diversity of attendees increased at the 2016 Seafood Summit in Malta, though total attendance declined.**

342 participants from 37 countries attended the 13<sup>th</sup> International Seafood Summit in Malta, down from 500 in New Orleans in 2015. There were several shifts in attendee composition, described below, but it is too early to determine whether these shifts indicate new trends, as the decrease in attendance may have had an influence.

- **Share of Internationals Increases:** The summit in Europe was aimed at maintaining international engagement: 81% of attendees at the 2015 New Orleans Summit were North American, compared with 42% in Malta.
- **Share of Decisionmakers Increases:** The proportion of attendees with job titles including “CEO”, “Board Member,” or “Director” grew from 33% in 2015 to 46% in 2016.
- **Share of Nonprofit Attendees Decreases:** 36% of attendees in 2016 were from nonprofits, compared to 51% in 2015.



## The role of technology in traceability and monitoring has continued to grow

**In addition to U.S. and E.U. trade policy and import controls (see Policy section), there have also been notable technological improvements to advance seafood supply chain traceability.**

### Supply Chain Traceability Technologies



**DNA testing** uses a specific segment of seafood's genetic material to determine its exact species. DNA testing can be used to improve transparency and to combat seafood mislabeling and fraud. For example:

- A UCLA and Loyola Marymount University study in 2017 found that 47% of sushi in Los Angeles was mislabeled, to increase profit or avoid environmental regulations.
- TruFish, based in North Carolina, utilizes a DNA testing system to identify the species of fresh and frozen fish.



**Inventory tracking systems** continue to increase in popularity. Bar code labeling of seafood allows for more accurate supply chain and inventory management.

- U.S. import/distribution company Norpac Fisheries Export has a bar code tagging system for individual fish, through its traceability management system called Insite Solutions. The capture location, date it was unloaded, species, catch method, and weight of the fish can all be traced.
- ThisFish, launched by Ecotrust Canada in 2013, is committed to a more transparent seafood supply chain, as well. Fish harvesters code their catch and upload the information onto ThisFish.info; others upload information on product handling and shipping.



### Fishery Monitoring Initiatives



**Vessel tracking systems (VTS)** help monitor fishing fleets to prevent IUU fishing and improve traceability.

- Pelagic Data Systems (PDS), founded in 2014, designed and developed an ultra-light VTS for small-scale fisheries, to track fleets, monitor activities, provide data analysis, without requiring the type of complex satellite-based system used on large fishing fleets. The VTS device is solar-powered and collects and transmits information on the artisanal boat's location. The artisanal fishing sector previously received much less attention than major fleets.



**AIS/satellite data**, if properly tracked, can help visualize fishing activity globally.

- Global Fishing Watch is a platform that uses this technology. Developed through a partnership between Oceana, Google, and SkyTruth, Global Fishing Watch is a publicly available website that tracks global fishing activity. In February 2017, Global Fishing Watch released a report analyzing AIS signals from ships from 2012 to 2016, having successfully identified and tracked the ships globally.

# CREATING CONDITIONS FOR BUSINESS CHANGE: ENABLING INITIATIVES

NGOs have continued to advocate for traceability improvements through a variety of initiatives at every level of the supply chain

More than two dozen NGOs are promoting traceability protocols and programs from on the water to in stores. Many are shown below:

## Voluntary Market and Supply Chain Efforts



*For more information on individual organizations' traceability efforts, please see the organizations' websites.*

For example, Sustainable Seafood Coalition members improved the reliability of environmental claims on seafood products by 15% compared to 2011.

**The Sustainable Seafood Coalition (SSC), a partnership between United Kingdom businesses that formed in 2011, works at all segments of the seafood supply chain to improve sustainability.** Its 19 seafood business members commit to SSC Codes of Conduct on Environmental Claims and Environmentally Responsible Fish and Seafood Sourcing.

**Assessment of SSC Labeling and Sourcing Codes 2016 findings:\***

- 17% of environmental claims on products were misleading or unverified, a 15% improvement from ClientEarth’s Labelling Report findings in 2011
- 89% of products were sourced in alignment with SSC’s Sourcing Code



**Members:**

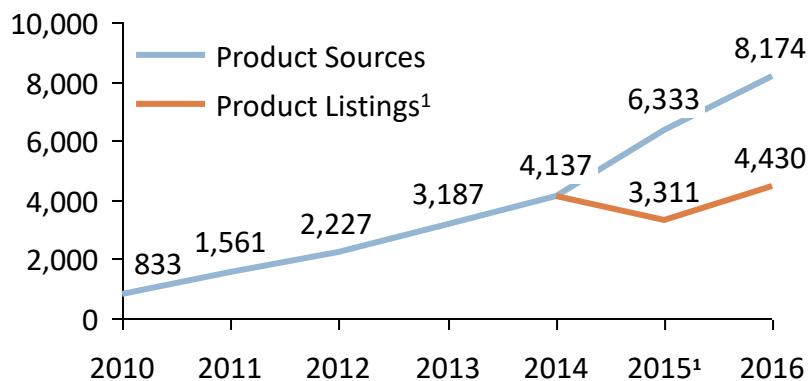
- In addition to 19 seafood businesses, members include 4 representative bodies, one NGO (ClientEarth - Secretariat), and the Fish Fight Campaign
- 6 out of the 7 major retailers in the United Kingdom, covering 75% of fish sales at the retail level

\* Percentages include findings from five nonmember businesses that are not committed to SSC codes. Source: Communication with Katie Miller, ClientEarth; <http://tinyurl.com/khtpnjq>.

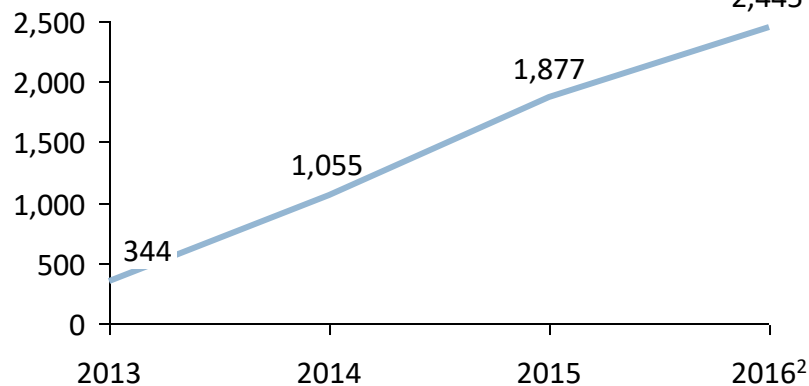
# FishChoice member registration more than doubled since 2014, while products listed and web visits also continue to grow significantly

**FishChoice provides a seafood directory that highlights sustainably produced species and products, making it easier for those working within the seafood industry to find, procure, and sell more responsible products.** The number of registered users, listed products, and web visitors continues to grow rapidly.

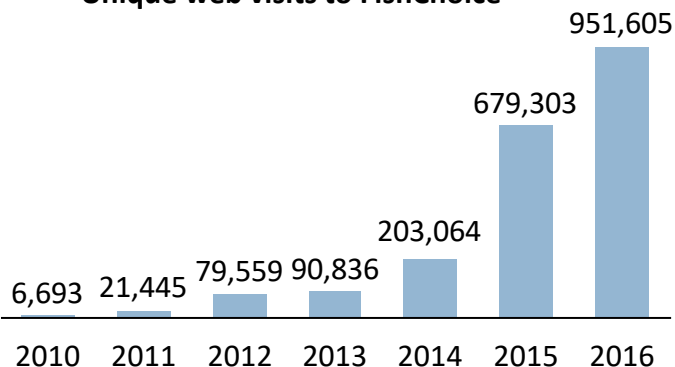
Product sources and product listings on FishChoice



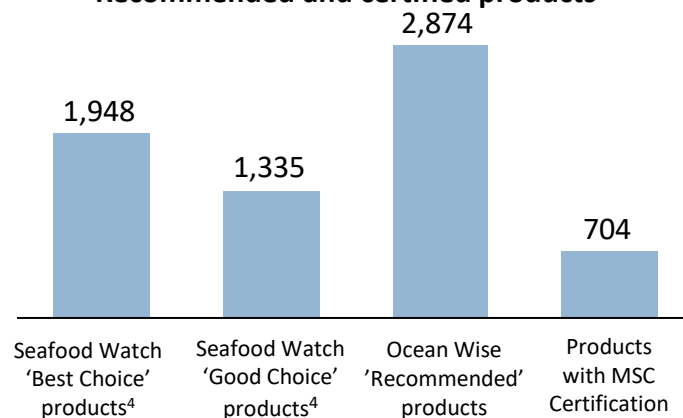
Member registrations running totals on FishChoice<sup>3</sup>



Unique web visits to FishChoice



Recommended and certified products



1. In 2015, FishChoice consolidated multiple sources into once species listing; 2. Implemented a spam filter on registrations in 2016; 3. Registrations reset mid-2012 with a new platform; 4. Does not include eco-certification Source: Communication with Rich Boot and Justin Boevers, FishChoice.

# FishSource, a database monitoring the status and environmental performance of fisheries, continues to grow in registered users and fishery profiles

**FishSource users from the seafood industry have tripled since 2010.** FishSource also continues to add users from other sectors and to expand and verify the fishery information in its database.

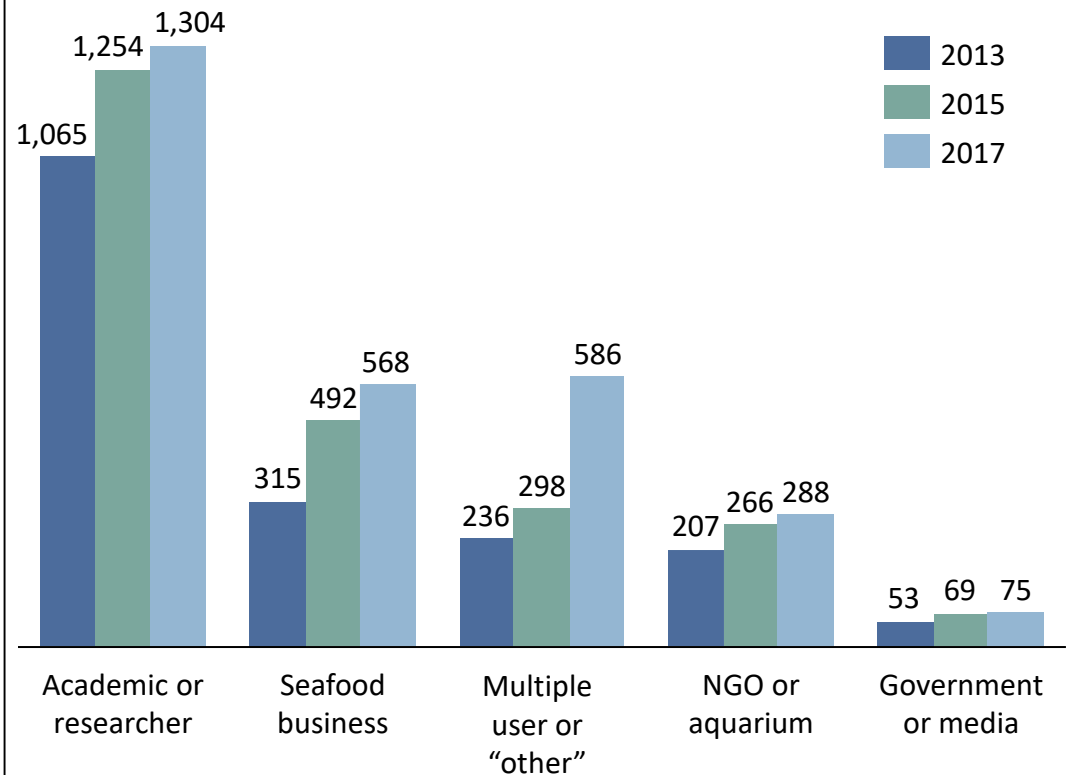
Profiles in FishSource as of January 2017

Total	1119
Draft	61
Live	1058

- Previously, FishSource profiles could describe either stocks or fisheries, including MSC (certified or under certification) fisheries and FIPs
- Now a profile is defined around a single stock, and can include multiple nested fisheries, defined more strictly as a single gear used by a single flag country, within a single management unit, on a single stock; and MSC fisheries and FIPs are associated with the respective fisheries

Registered FishSource users\*

(total n= 2843, up from 1194 in 2008)



\*Registered users may or may not have accessed the site recently.  
Source: Communication with Susana Segurado, SFP.



# Policy change

METRICS INCLUDED

Global status and trends in fishery health and exploitation

GOAL: IMPACT ON THE WATER

## Key takeaways

- IUU fishing remains a major theme on the international stage. The E.U. has continued to utilize its IUU card system and the U.S. implemented its own IUU legislation, the Seafood Import Monitoring Program, though it is still unclear what impact the new administration will have on this legislation.
- The Port State Measures Agreement went into effect in June 2016 as the first binding international legislation to combat IUU fishing and has been ratified by 47 countries.
- With only 3% of oceans designated as Marine Protected Areas, the global community is less than halfway to achieving the Aichi Target 11 of conserving 10% of oceans by 2020, though an additional 3% are covered by proposed protected areas.
- The U.S.'s current political landscape, with the election of President Trump, could threaten progress toward sustainable seafood and oceans globally.

## POLICY CHANGE

A combination of advocacy and corporate support help drive improved government regulations and enforcement

- Policy timeline
- Port State Measures
- Marine Protected Areas
- E.U. policy update
- U.S. policy update

sustainable seafood, based partly on consumer awareness and NGO partnership.

Consumer survey data

Industry event attendance

# Timeline of major marine policy legislation and actions

Year	United States	Rest of World
2006	U.S. Magnuson-Stevens Fishery Conservation and Management Reauthorization Act of 2006	
2007	Catch share program implemented for Gulf of Mexico Red Snapper Bering Sea closed to bottom trawl fishing	<b>Mexico:</b> Progressive fishery law passed; allows for the establishment of government-administered fishery refugia <b>Indonesia:</b> Law passed allowing local governments to establish, manage, and fund marine protected areas (MPAs)
2008	IFQ system approved for West Coast groundfish trawl fleet	
2009	200,000 square miles of U.S. Arctic waters protected from industrial fishing	<b>Indonesia:</b> Amends national fisheries act; announces goals to expand MPAs from 6 mha to 20 mha by 2020
2010	Obama signs Executive Order establishing a National Ocean Policy	<b>Europe:</b> E.U. IUU legislation enters into force requiring all seafood imports to be accompanied by a catch certificate with information about the species, catch location, fishing vessel, date of capture, and any trans-shipments that have taken place
2011	Catch share implemented for the Pacific groundfish trawl fishery	
2012	NOAA meets the requirement specified in the 2007 Magnuson-Stevens Act to implement catch limits for all federally managed fisheries	<b>Australia:</b> Puts ~1/3 of coastal waters into world's largest network of marine preserves <b>Chile:</b> New fisheries law requires ITQs and other key fishery management actions

# Timeline of major marine policy legislation and actions

Year	United States	Rest of World
2013		<p><b>Europe:</b> European Parliament votes for reform of the Common Fisheries Policy that includes requirements to manage MSY and discard bans</p> <p><b>International:</b> CITES approves international trade restrictions for five species of threatened and endangered sharks</p>
2014	<p>Obama expands the Pacific Remote Islands National Marine Monument, creating the world’s largest protected marine reserve</p> <p>A U.S. Presidential Task Force is established to recommend a comprehensive framework of programs to combat IUU fishing</p>	<p><b>Europe:</b> The E.U. begins issuing trade sanctions (yellow and red cards) to countries not taking meaningful action to deter IUU. Red- and yellow-carded countries begin to take real action to improve their laws and monitoring and enforcement</p> <p><b>South Korea:</b> Updates deep-water fishing laws and improves enforcement</p>
2015	<p>U.S. Presidential Task Force on IUU releases recommendations in December 2014, followed by an action plan in March 2015</p> <p>Obama signs the Illegal, Unreported, and Unregulated Enforcement Act to combat IUU fishing and seafood fraud</p>	<p><b>Mexico:</b> Fishery and MPA enforcement strengthened, turned over to Navy</p>
2016	<p>U.S. is the 21<sup>st</sup> country to ratify the Port State Measures Agreement</p> <p>Obama administration publishes the final rule establishing the Seafood Import Monitoring Program to deter IUU fishing</p>	<p><b>International:</b> Port State Measures Agreement enters into force as an international treaty after the 25<sup>th</sup> party signs on to combat IUU fishing</p> <p><b>International:</b> The Commission for the Conservation of Antarctic Marine Living Resources agrees to create the world’s largest marine protected area off the coast of Antarctica</p>

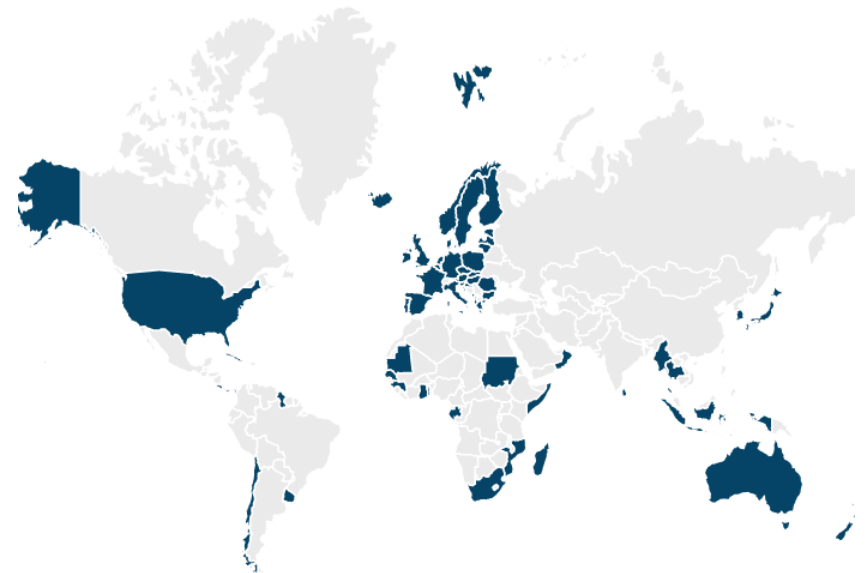
## PROGRESS ON POLICY CHANGE

# The Port State Measures Agreement enters into force in June 2016, launching the implementation phase

**The FAO Agreement on Port State Measures to Prevent, Deter, and Eliminate IUU Fishing (PSMA) entered into force in June 2016, one month after the 25<sup>th</sup> country ratified the agreement.** The PSMA is the first binding international treaty that focuses specifically on IUU fishing.

- Signatories agree not to provide port access or services to foreign-flagged vessels known to have engaged in IUU fishing.
- The PSMA makes it far more difficult to conduct IUU fishing under so-called “flags of convenience”—using the flags of countries that turn a blind eye to unsustainable or illegal fishing practices—by providing an enforcement mechanism to punish bad actors.
- Globally, countries are currently working to implement the PSMA. In June 2016, advisors from NOAA’s Office of Law Enforcement hosted workshops in Indonesia to train fisheries officials on best practices on implementation and combatting IUU fishing.

### 48 Countries Have Ratified the PSMA\*



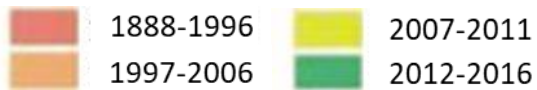
\*The EU counts as one country and one vote toward ratification. The overseas territories of France also count as one country and one vote toward ratification. This map does not include Japan, which is the newest country to ratify the PSMA, in May 2017. Source: Pew, <http://www.pewtrusts.org/en/multimedia/data-visualizations/2014/psma>; NOAA, “Fighting IUU Fishing at the Ports,” [http://www.nmfs.noaa.gov/ole/slider\\_stories/2016/indonesia\\_psma\\_training.html](http://www.nmfs.noaa.gov/ole/slider_stories/2016/indonesia_psma_training.html).

## PROGRESS ON POLICY CHANGE

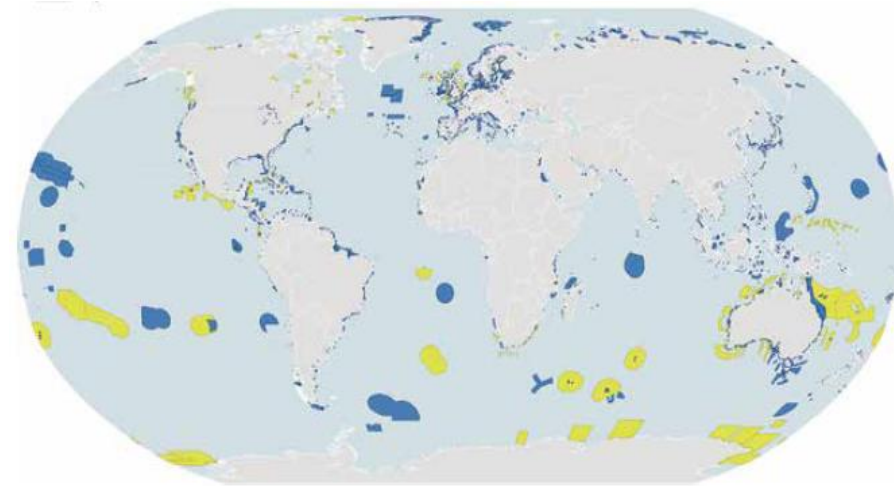
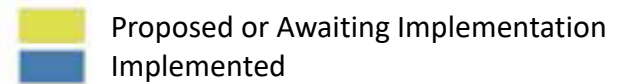
Marine protected area (MPA) coverage has almost doubled since 2005 to roughly 3%, and implementation of all proposed areas would push this to 6%

**Despite significant progress, the global community is less than halfway to achieving the Aichi Target 11 of conserving 10% of the oceans by 2020**, adopted by the Parties to the Convention on Biological Diversity in 2010. Many new MPAs are in remote, untouched areas such as the high-seas. Additionally, many new reserves have been designated by countries in the western Pacific Ocean region that have large Exclusive Economic Zones and smaller populations under their jurisdiction.

MPAs<sup>1</sup> by year of implementation



Proposed vs. Implemented MPAs



1. Levels of MPA protection include: no-take, some restrictions, and fishing allowed. Source: Marine Conservation Institute, MPAtlas (2017)

PROGRESS ON POLICY CHANGE

# The European Union’s traceability regulations have continued to make progress in the global effort to reduce IUU

## The E.U. has strong anti-IUU trade regulations.

The E.U. Regulation to prevent, deter, and eliminate IUU fishing entered into force in January 2010. The regulation requires all fishery imports to be accompanied by a certificate with information about the catch including species, location, vessel, date of capture, and any trans-shipments. Where a product is suspected as IUU, the E.U. member states can refuse to import the fish.

Countries that do not meet minimum requirements can be given a *yellow card*. If issues are not resolved after probation, a *red card* – or trade sanction – can be issued. Currently, Cambodia is the only country with a red card.

### Case Study of Success: Thailand

The threat of E.U. trade sanctions has had a powerful effect on several exporting countries. For example, in 2015, the E.U. issued Thailand a yellow card for unacceptable IUU practices. Since then, the Thai government has created a Command Centre for Combatting Illegal Fishing, which inspects fishing piers in Thailand. The yellow card is expected to be removed soon.

Country	Yellow <sup>1</sup> Carded	Red Carded	Red Delisted
Belize	2012	2014	2014
Cambodia	2012	2014	
Comoros	2015		
Curacao	2013-2017		
Fiji	2012-2014		
Ghana	2013-2015		
Kiribati	2016		
Korea	2013-2015		
Panama	2012-2014		
Papua New Guinea	2014-2015		
Philippines	2014-2015		
Republic of Guinea	2012	2013	2016
Sierra Leone	2016		
Solomon Islands	2014-2017		
Sri Lanka	2012	2014	2016
St. Kitts and Nevis	2014		
St. Vincent and Grenadines	2014		
Taiwan	2015		
Thailand	2015		
Togo	2012-2014		
Trinidad and Tobago	2016		
Tuvalu	2014		
Vanuatu	2012-2014		

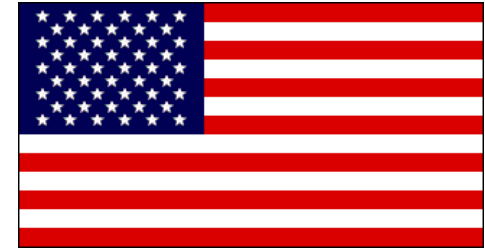
<sup>1</sup> The absence of an end year in the time-range indicates that the yellow card is still in effect. Source: <http://tinyurl.com/mhkcvj6>.

## PROGRESS ON POLICY CHANGE

In 2016 the U.S. established the Seafood Import Monitoring Program as one measure to combat IUU seafood entering the U.S. market

### The United States is in the process of implementing its own trade-related IUU regulations.

- In November 2015, the Obama administration signed the Illegal, Unreported, and Unregulated Fishing Enforcement Act, in response to the Presidential Task Force on Combatting IUU Fishing and Seafood Fraud.
- The Act also supports the Port State Measures Agreement (PSMA), as it includes several provisions aimed to prevent IUU-harvested fish from entering the United States.
- In December 2016, the National Oceanic Atmospheric Administration published the final rule pursuant to the Magnuson-Stevens Fishery Conservation and Management Act, establishing the Seafood Import Monitoring Program (SIMP). SIMP is a risk-based traceability program that uses permitting, data reporting, and recordkeeping requirements as a means to prevent IUU seafood and seafood products from entering U.S. commerce. Seafood and seafood products can therefore be traced from point of harvest to entry into the U.S. market. January 1, 2018, is the mandatory compliance date for the majority of the priority species listed below.



- |                          |                   |   |
|--------------------------|-------------------|---|
| ○ Abalone*               | ○ King Crab (red) | ○ Shrimp*   |
| ○ Atlantic Cod           | ○ Pacific Cod     | ○ Swordfish   |
| ○ Blue Crab (Atlantic)   | ○ Red Snapper     | ○ Tunas: Albacore, Bigeye, Skipjack, Yellowfin, and Bluefin |
| ○ Dolphinfin (Mahi Mahi) | ○ Sea Cucumber    |   |
| ○ Grouper                | ○ Sharks          |   |

\*Abalone and shrimp compliance will be phased in at a later date.

Source: [http://www.iuufishing.noaa.gov/Portals/33/NMFS\\_SIMP%20FR\\_%20Fact%20Sheet.pdf](http://www.iuufishing.noaa.gov/Portals/33/NMFS_SIMP%20FR_%20Fact%20Sheet.pdf).

PROGRESS ON POLICY CHANGE

# The U.S. Presidential Administration and Congress could negatively impact fishery progress

**A variety of actions by the administration and Congress could impede progress on several sustainable seafood, fishery improvements, and ocean conservation priorities, both federally and globally.**

Issue	Quote	Source
Trans-Pacific Partnership (TPP)	“There’s no question that [the TPP] would have benefited our fisheries in many ways. The seafood industry employs more people than any private sector industry in the state. Alaska’s commercial fishermen rely on strong global markets, and the withdrawal of the U.S. from the TPP will harm our fishing industry.” <sup>1</sup>	Alaskan Senator Bill Wielechowski
NOAA’s Sea Grant program	“[Sea Grants are] a conduit of information from the communities to scientists and universities, and a conduit of information from universities to communities so that they can take advantage of the newest breakthroughs in science. [Previous] federal dollars leveraged a lot of additional financial resources, [and by cutting the federal funding], you hurt states big-time.” <sup>2</sup>	Jane Lubchenco, former NOAA administrator under President Obama
Seafood Imports	“Given the enormity of our coastlines, given the enormity of our freshwater, I would like to try to figure out how we can become much more self-sufficient in fishing and perhaps even a net exporter.” <sup>3</sup>	Secretary of Commerce Wilbur Ross
NMFS fisheries regulation	“Having to arbitrarily negate two regulations in order to change management rules is not cost-effective nor is it simple. Rather than solve an issue, this order will hinder and complicate an already complex process for our nation’s fishermen. New regulations do not prohibit fishermen from doing their jobs; instead, they often put new science on the water and make it easier for fishermen to make a living. We should not be slowing this process further but instead finding faster ways to get science and streamlined regulations on the water.” <sup>4</sup>	Ben Martens, Maine Coast Fishermen’s Association Executive Director