

the David & Lucile Packard FOUNDATION



Progress toward Sustainable Seafood – By the Numbers 2015 Edition

California Environmental Associates

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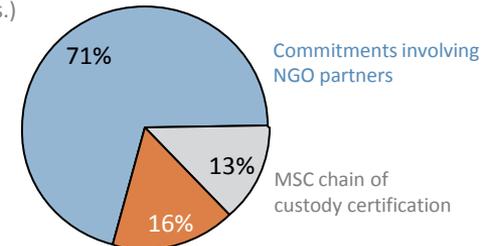
Executive Summary

There are signs the sustainable seafood movement is reaching maturity, as growth in corporate commitments, certification,* and fisheries improvement projects* (FIPs) appears to have plateaued.

- Most major North American and European retailers now have commitments or partnerships related to wild-caught seafood issues.
- In response to overwhelming retailer demand, other companies throughout the supply chain have started to make their own commitments to sourcing sustainable seafood as well as supporting certified fisheries and FIPs through preferential sourcing and direct investment.
- While the overall trend of certification remains strong, MSC-certified volume has remained around 9% of global landings in the past few years. Certification of farmed seafood has continued to grow, but represents less than 5% of global production volume.
- Similarly, FIPs continue to gain prominence. The number of FIPs continues to grow each year, though their share of global landings continues to hover around 10%.
- General interest in sustainability from the seafood industry appears to be stable, measured by media coverage and issue salience.

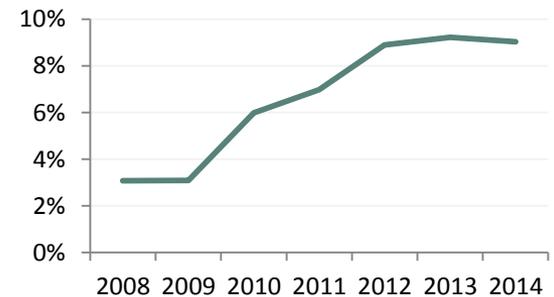
Of the top 38 North American and European retailers, those representing more than 80% of sales have some level of commitment to sustainable seafood, either through an NGO partnership or an MSC chain of custody certification

(Chart shows total sales of top U.S. and European retailers.)



No known commitments

MSC-certified volume as % of total wild catch has hovered around 9% over recent years



* MSC and FIP volumes appear to have plateaued, although the number of fisheries and units of certification continue to grow each year.

Executive Summary

The state of fisheries may now be improving in certain geographies, namely North American and Europe. However, it is difficult to draw direct, causal links between the conservation markets movement and widespread fisheries recovery.

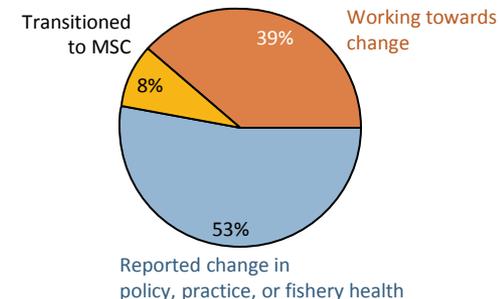
- In general, major fish stocks in the developed world appear to be unevenly turning the corner toward restoration. Fish stocks without stock assessments appear to be in worse shape and may continue on a downward trajectory. These fisheries appear to be some of the more difficult to influence through market incentives.
- Certified fisheries are better managed and healthier than most other fisheries, but are primarily located in OECD countries; FIPs in advanced stages report improvements in policy, practice, and/or fishery health (“change on the water”) and primarily engage fisheries in non-OECD countries.

Major policy changes in Europe and the United States, coupled with public concerns about mislabeling and labor practices, are also helping to transform fishing practices across the globe.

- Successful implementation of the Magnuson-Stevens Act in the United States and the European Union Common Fisheries Policy in Europe have reduced overfishing in these regions and have stimulated recovery.
- The European Commission’s anti-illegal, unreported, and unregulated (IUU) fishing card system, which imposes upon trade-partner nations warnings (yellow cards) and trade bans (red cards), appears to be catalyzing significant attention to fisheries management in some supplying nations (e.g., South Korea, the Philippines) where management has historically been weaker.

More than half of all FIPs report changes in fishing practice, policy, or fishery health (change on the water), and a handful have advanced to MSC certification

(Chart shows number of FIPs; n=83)



Some countries that sell to Europe have instigated reforms to avoid being red-carded and blocked from selling to Europe, as were Cambodia, Sri Lanka, Guinea, and Belize.

Overview of Seafood Metrics Project

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)
- 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, publically available data
- Effort broadly maps to the Conservation Alliance for Seafood Solutions' theory of change, first established in 2008

LIMITATIONS

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

INTRODUCTION

Overview of Seafood Metrics Project

This report’s structure is based on the Conservation Alliance for Seafood Solutions’ theory of change. For each component of the Theory of Change, metrics of progress have been identified and included in this report. Where available, time series information on these indicators/subjects is provided.

METRICS INCLUDED

Global status and trends in fishery health and exploitation

GOAL: IMPACT ON THE WATER

Certification data

Fishery Improvement Projects

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

Policy timeline

E.U. policy update

U.S. policy update

Port State Measures

Seafood trade flow data

Key commodity trade flow trends

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.

POLICY CHANGE

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

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

- Many formally assessed fisheries, which are largely concentrated in the developed world, appear to be turning a corner toward recovery.
- Fisheries in the developing world are still being overfished and many stocks continue to fall to unsustainable levels.
- South and Southeast Asia represents an increasingly large portion of total global catch, though substantial data deficiencies contribute to significant uncertainty regarding the health of stocks in the region.
- National capacity for good fisheries governance is closely connected to overall stock health, and a new study suggests that the benefits associated with investing in management reform and effective implementation always exceed the cost.
- Aquaculture now comprises half of all seafood produced annually and is projected to grow rapidly (wild capture will likely remain static). Production occurs almost entirely in Asia, and only a small portion of aquaculture products reach western markets.

Our view of global fisheries varies depending on information source

Perhaps 30-40% of wild stocks are overfished. However, global wild fisheries-related databases vary in their levels of coverage and differ in the methods of estimating the health of stocks, so different sources produce different assessments. Whereas the global state of fisheries has been in decline over the past half century, at least two resources report signs of stabilization over the past 5-10 years.

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 judgement to estimate the state of fisheries.

Sea Around Us

Uses catch history to estimate both assessed and unassessed stocks. The available data exists through 2006.

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

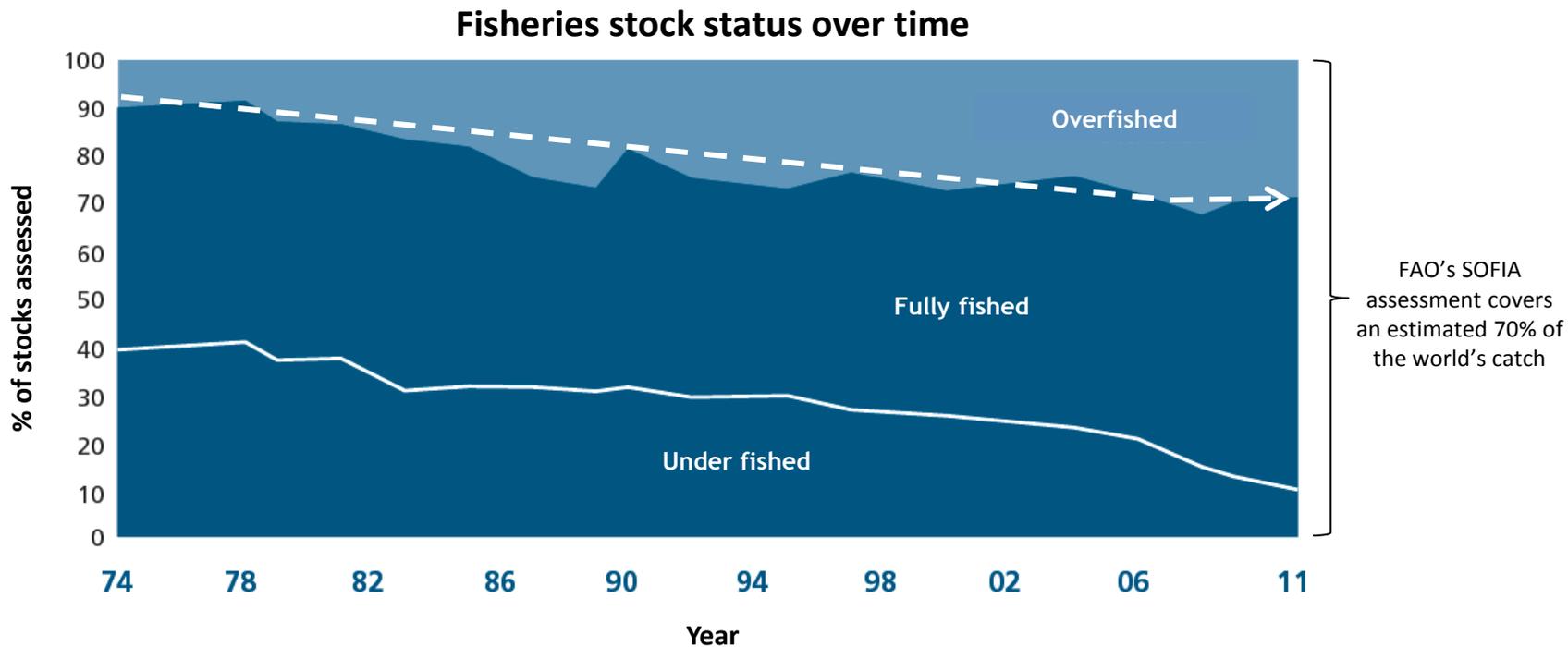
Costello et al.

Costello et al. estimate the state of both assessed and a portion of unassessed stocks using a model based on catch, life history, and fisheries development data.



FAO SOFIA: 30% of stocks are overfished; this has remained stable for the past five years

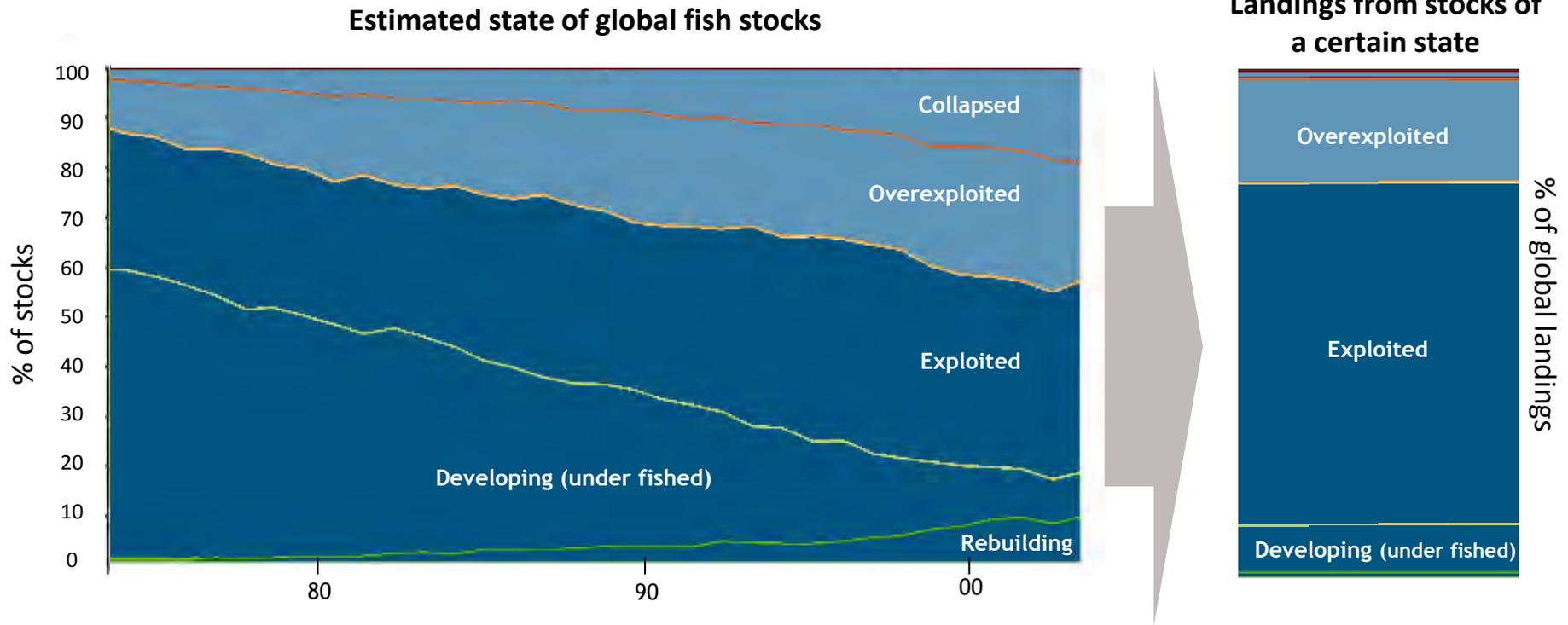
The FAO suggests that overfishing has decreased over recent years, based on stock assessments and expert judgment on many of the stocks that lack assessments.



Over the past few decades the number of overfished stocks has increased significantly, but over the past few years the number of overfished stocks appears to have stabilized even as more and more stocks are fully-fished.

Sea Around Us: 40% of stocks may be overfished or collapsed

Pauley 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.

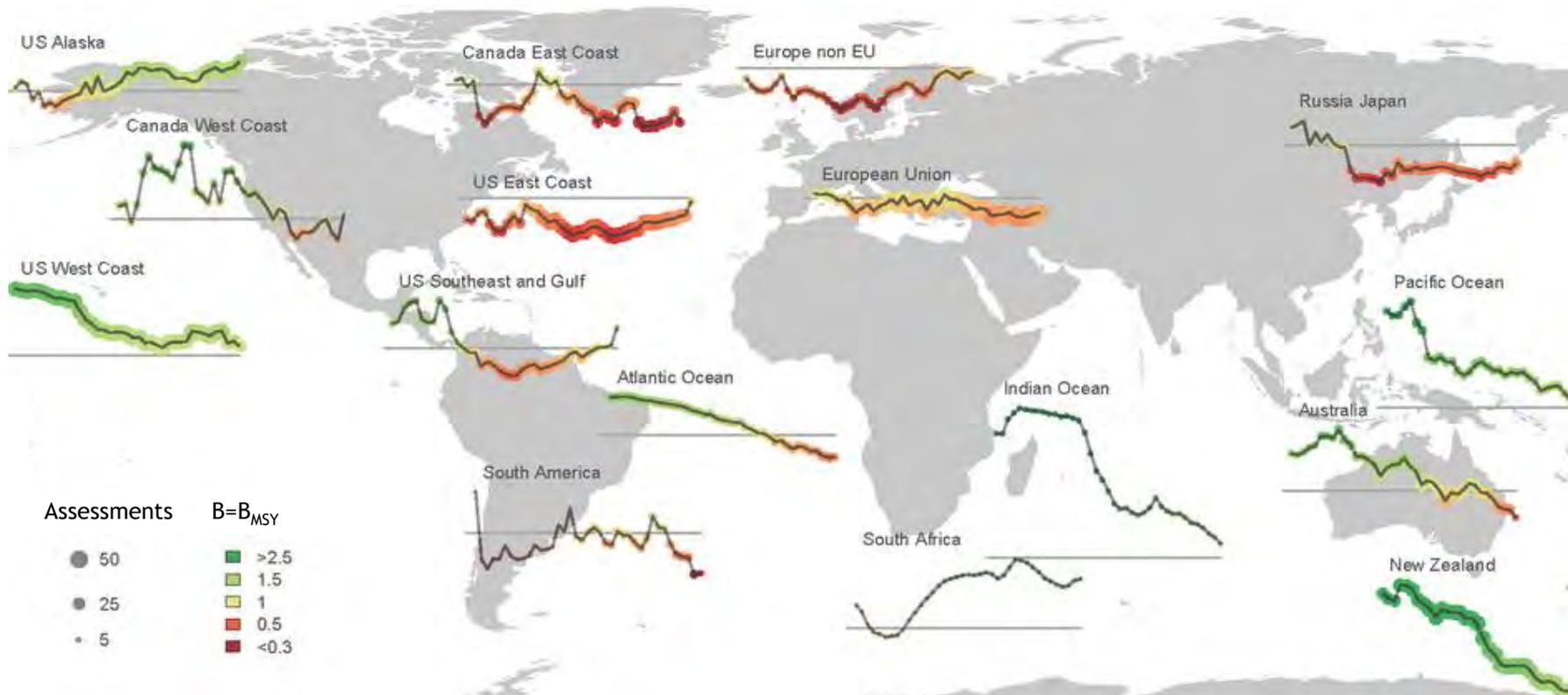


The available data stretches only to the mid 2000s, but at that time there were early signs that global stock statuses might be beginning to improve.

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.

Fisheries stock biomass

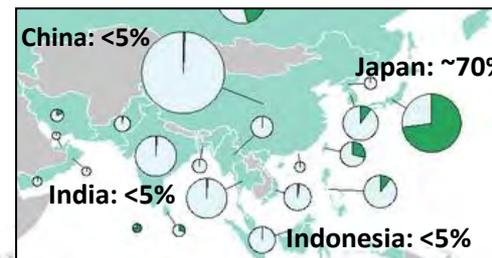


Color and vertical position represents the proportion of the stocks in the region that are overfished. Thickness of lines is proportional to how many stocks are contained in the data base.

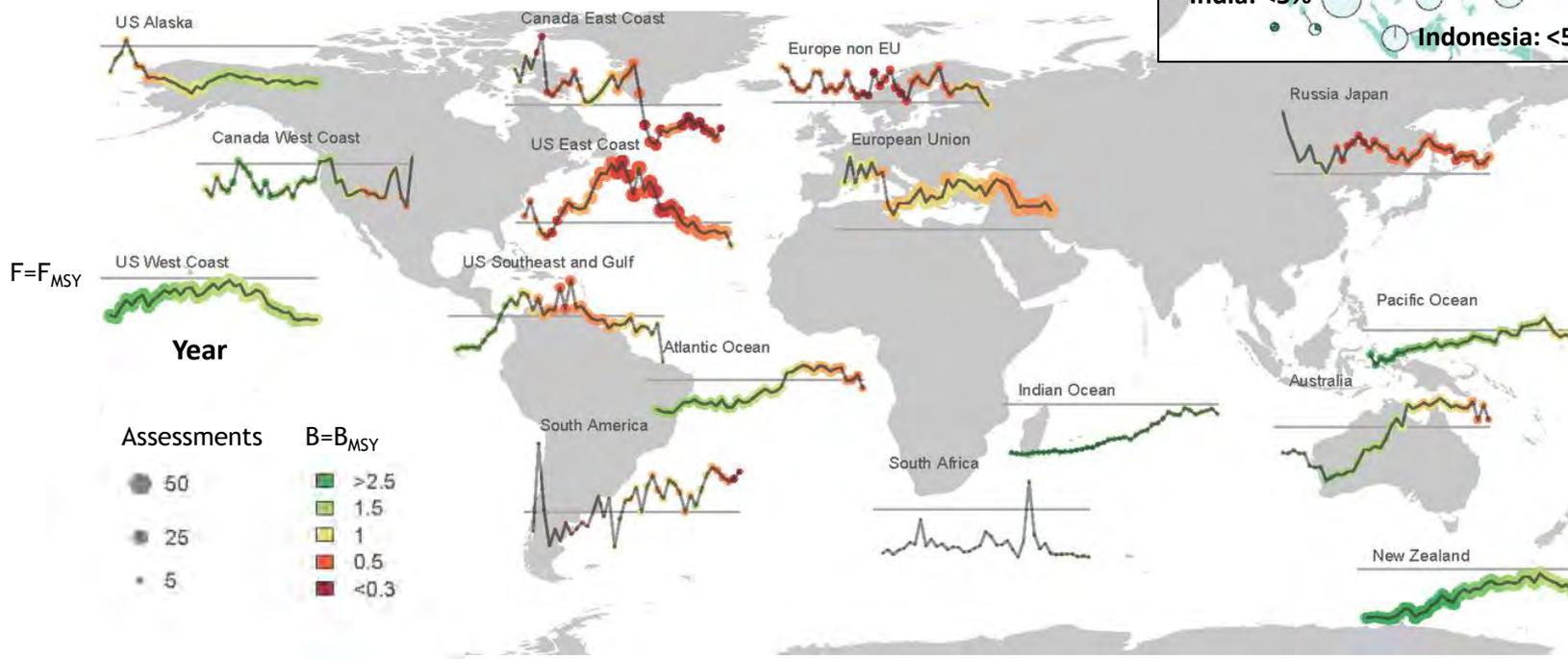
RAM Legacy: Fishing pressure may be rising in Asia, but data deficiencies prevent greater certainty or insight

Based on the available data, fishing pressure appears to be rising in Asia. However, RAM database coverage in most Asian countries represents less than 20% of total catch, so uncertainty is high.

% of catch covered by RAM Legacy

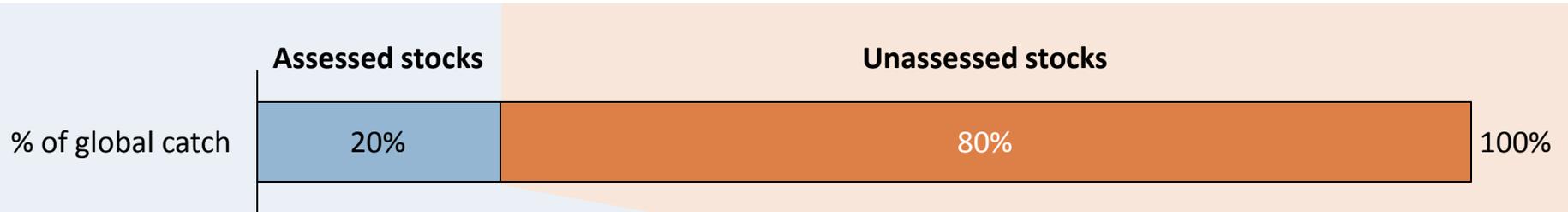


Fisheries mortality



Vertical position represents overfishing, with lower numbers representing less fishing pressure. Color 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 status of most of the world’s fisheries remains poorly documented



Only 20% of the world’s fisheries landings have been formally assessed. Of the fisheries for which good data are available, an increasing portion are fully fished while the number that are overfished appears to be leveling off. Most of these are fisheries in the developed world, where management has improved, albeit unevenly...



...meanwhile, the status of the remaining 80% of unassessed stocks is less clear, but the data we do possess suggests that these stocks are in worse condition than the assessed stocks. Many of the unassessed stocks are in the developing world and have been subject to increasing fishing pressure over recent decades.

Costello et al. dataset: Unassessed fisheries appear to be in poor shape

Assessed fisheries are a mixed bag.

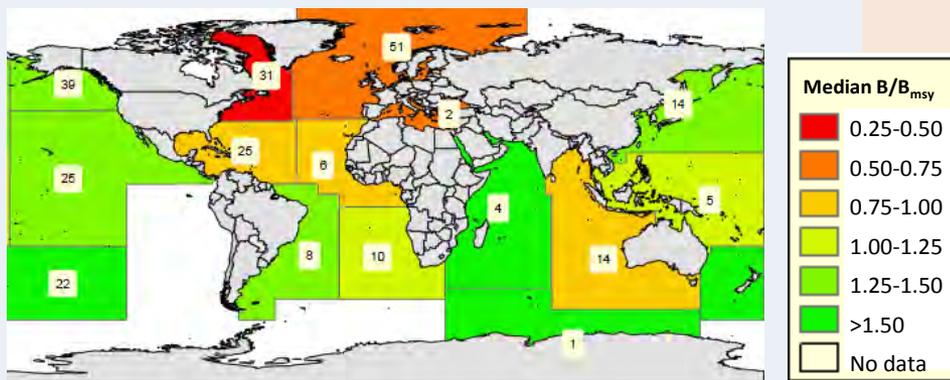
Most of the assessed fisheries in the Northern Pacific appear to be relatively healthy, whereas more than half of those in the North Atlantic have been overfished ($B/B_{msy} < 0.75$). However, only a handful of fisheries have been assessed beyond the North Atlantic and North Pacific.

Unassessed fisheries appear to be in worse shape.

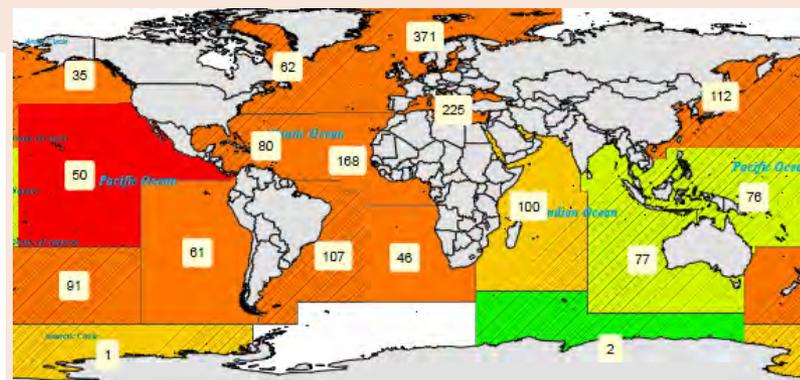
Across the globe, more than half of the unassessed fisheries may be overfished. Most stocks across the Atlantic and Pacific (except for in the Western Central Pacific) are significantly overexploited ($B/B_{msy} < 0.75$). The only relatively healthy spots appear to be in the Indian Ocean and the Southern Ocean, though RAM Legacy indicates they may be declining as well.



Map of median B/B_{msy} of stock assessed fisheries 2000-2007, by FAO region



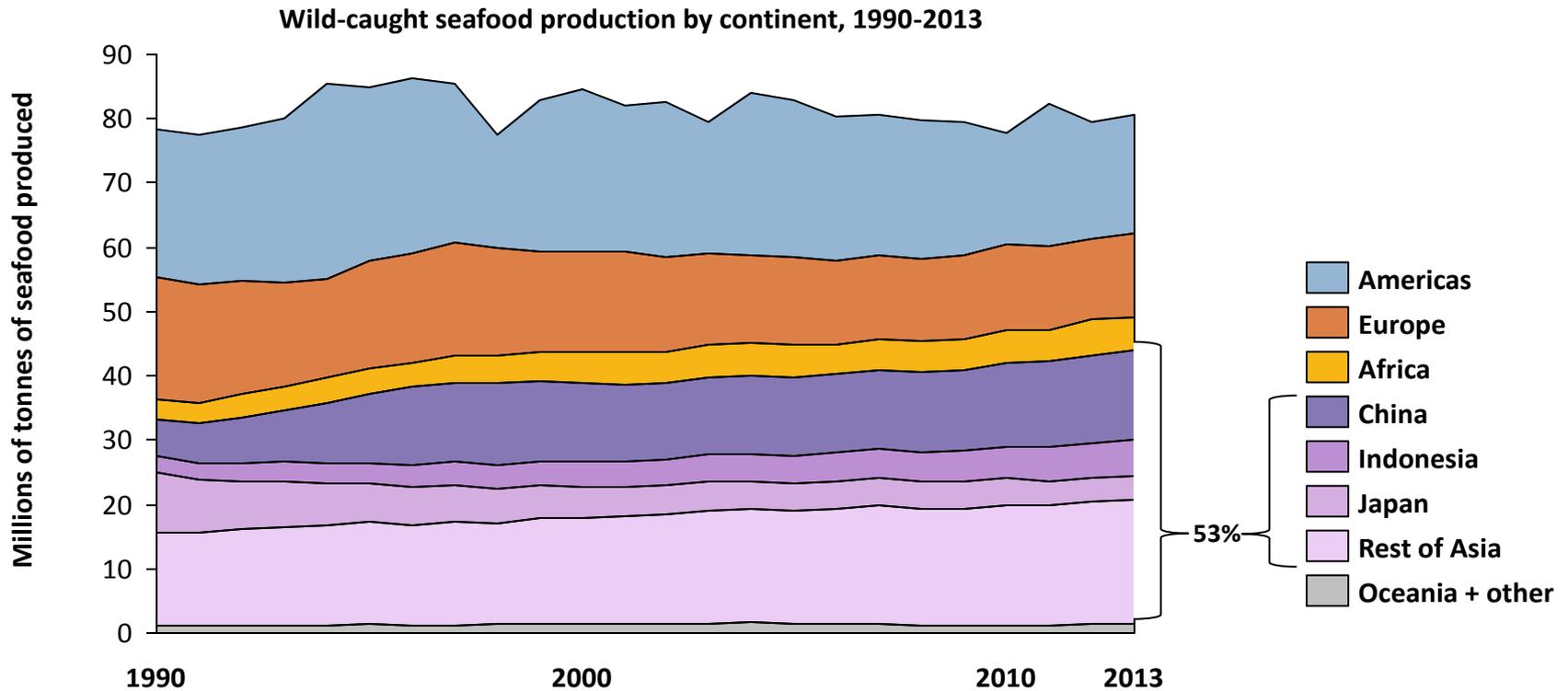
Map of median B/B_{msy} of unassessed fisheries in 2009, by FAO region



Numbers indicate number of assessed/ unassessed fisheries. Hashed regions are those where modeled landings comprise less than 40% of total reported regional landings; uncertainty may be greater in these regions.

Asia now accounts for more than 50% of global wild-caught production; the overall condition of these stocks is unclear

Asia accounts for the majority of marine seafood production globally, and continues to grow in significance. China accounts for approximately 30% of Asian catch. Many Asian populations rely on seafood as a critical source of protein and livelihoods, yet current catch levels may be unsustainable in many places.

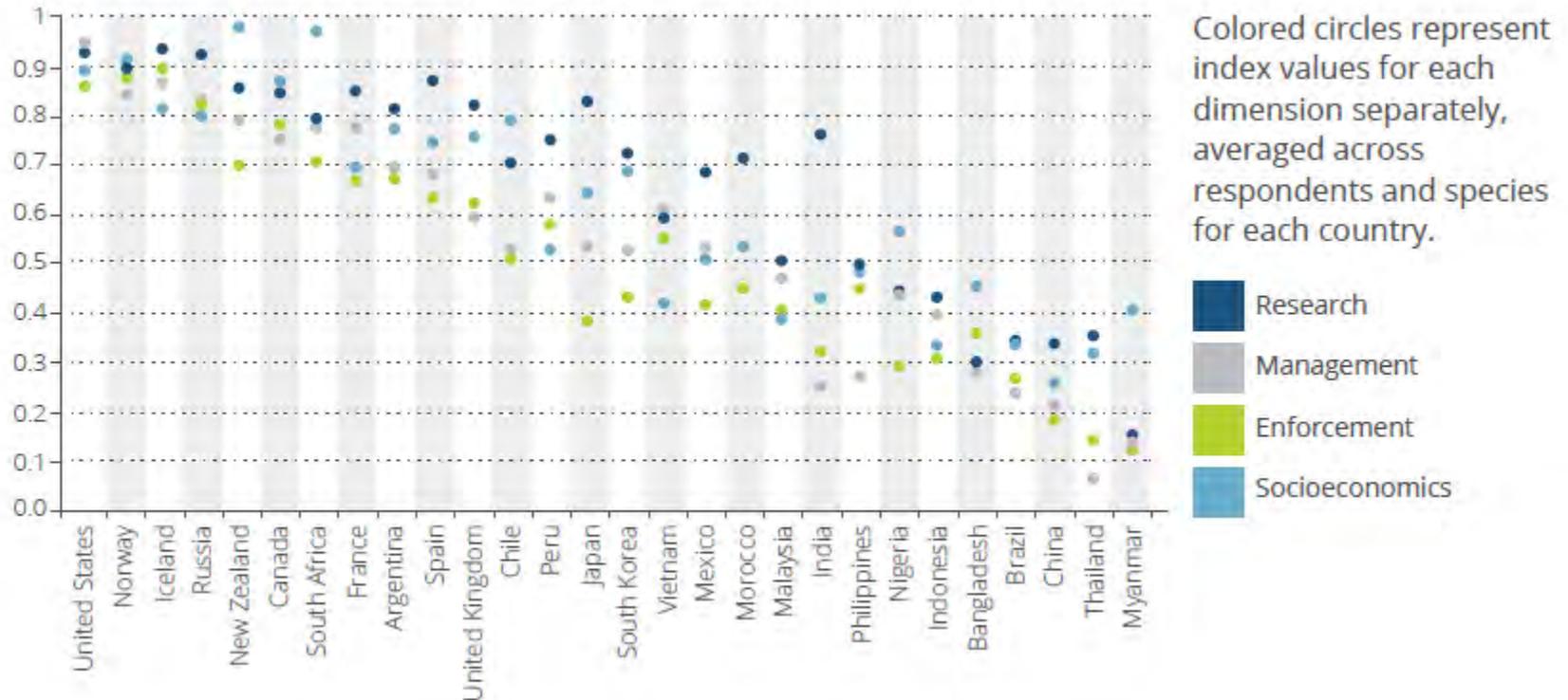


IMPACT ON THE WATER

Part of the challenge is that countries' capacity for fisheries management vary greatly; management capacity correlates strongly with fisheries health

Because fisheries are a common pool resources, good fisheries governance is closely connected to stock health. In general, fisheries governance has been improving globally, but there are still vast differences between countries' ability to manage marine resources effectively. While good management sometimes comes at a cost—countries like the US, Norway, and Canada spend multiples more on management compared to Morocco or Thailand—these management costs yield more than 10x in economic benefits, on average.

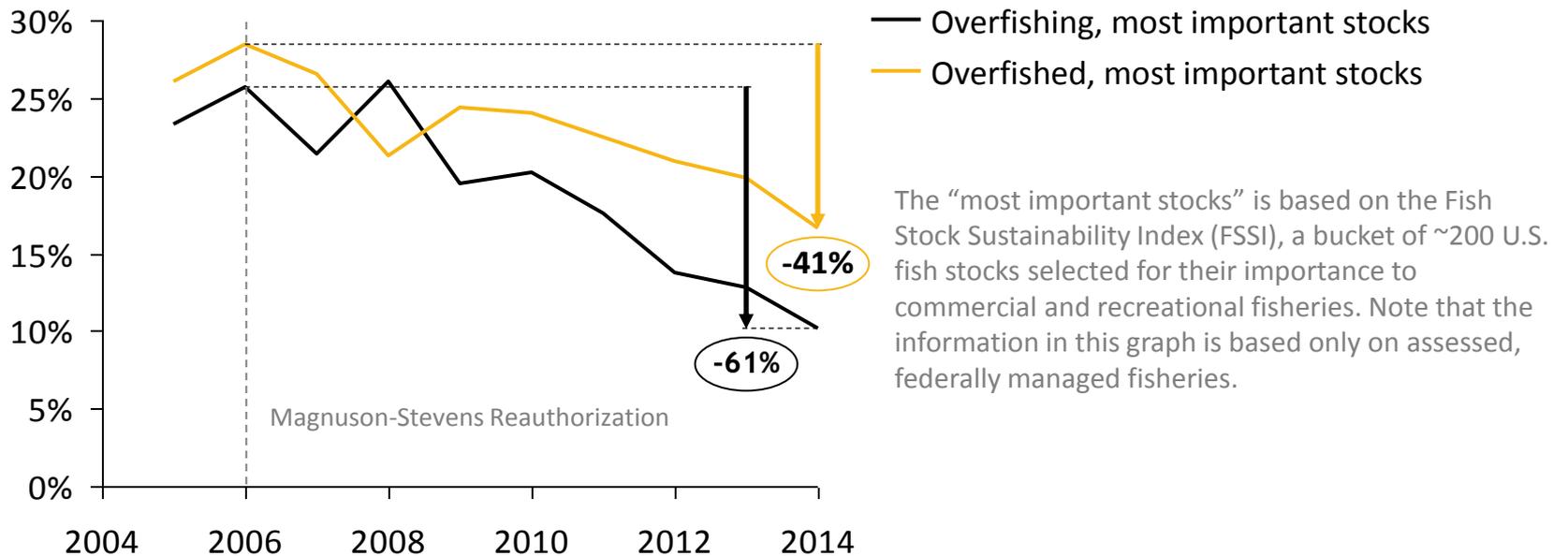
Fisheries governance index – preliminary results



The U.S. continues to make progress in reducing overfishing in federal waters

The number of U.S. fisheries experiencing overfishing has been slashed in half over the past decade after the 2006 reauthorization of the Magnuson-Stevens Act and subsequent amendments. Of the most important federally managed stocks, 10% are subject to overfishing*, down from 23% in 2005. As of 2014, only 17% are overfished*, down from 26%.

Percentage of fisheries that are overfished or subject to overfishing in the U.S., of stocks where the status is known

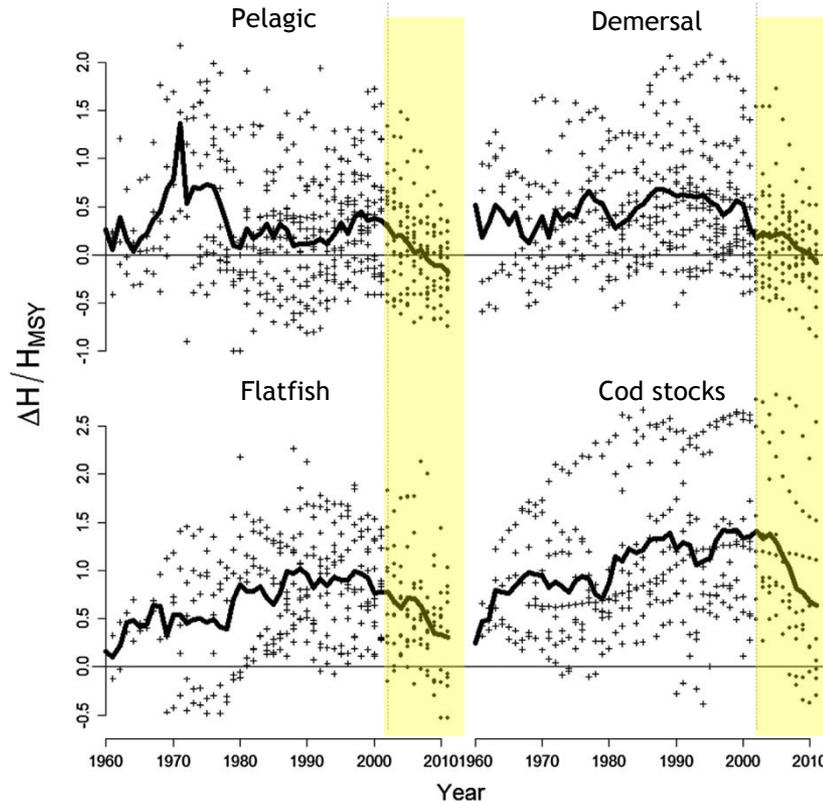


* Overfished refers to the state of the stock (i.e., biomass), while overfishing refers to whether catch is occurring at a sustainable level (i.e., fishing pressure/mortality).

European stocks are also faring better

Since the reform of European Common Fisheries Policy in 2002, overfishing of many stocks has decreased. Major policy changes then include detailed stock recovery plans, expanded effort control (restrictions on days at sea), and more aggressive, multi-year catch limits.

Rates of overfishing in Northeast Atlantic (European) fish stocks



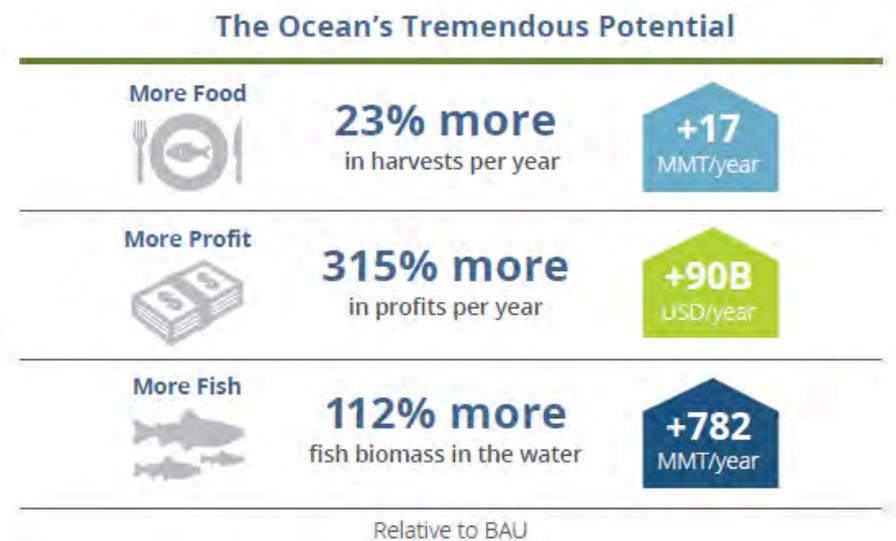
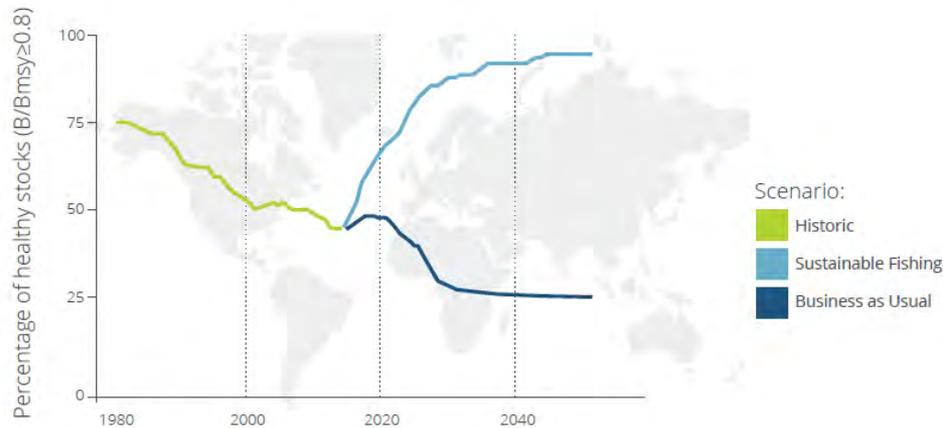
H is the exploitation rate, or intensity of fishing. An H/H_{MSY} of less than 1 is indicative of a sustainably fished stock. Since the reform of European fisheries policy in 2002 (indicated by a dotted line), overfishing has decreased. In some cases, the improvement may have begun even before the policy reform.

IMPACT ON THE WATER

More than nearly any other resource, fisheries possess tremendous potential for improvements that generate both economic and environmental gain

A new, draft analysis suggests that sustainable fisheries management could yield rapid, significant improvements in catch, fish biomass, and profits. A companion suggests that for all countries, the overall benefits associated with management reform and effective implementation exceed the associated costs (though benefits may accrue to private actors while costs are borne by governments).

Global stock health under sustainable fishing vs. BAU scenarios – preliminary results



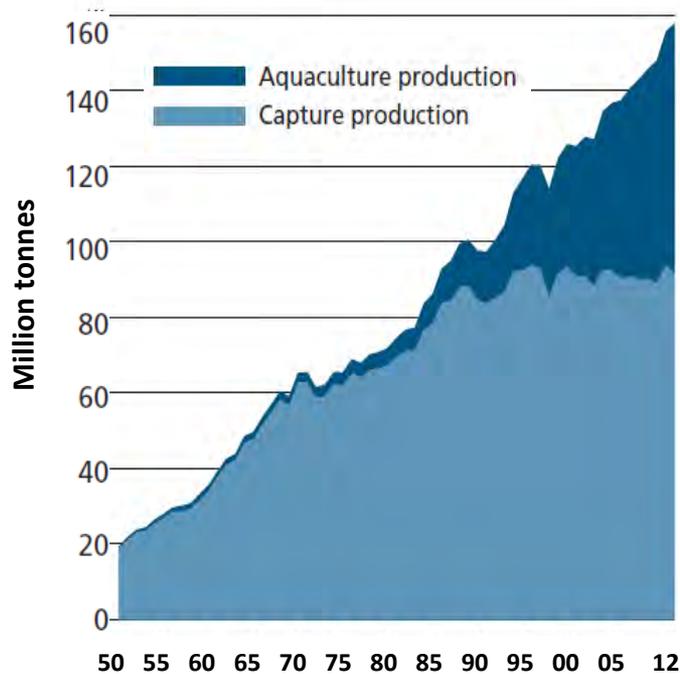
This analysis, based on stocks representing 77% of global catch, suggests that in 10 years global fish production could increase by 14% even as the amount of fish left in the water for conservation grows by 36%. Over the long term, profits could increase more than 3-fold (90 billion USD). This is true across every fishing nation, but is even more true for some.

IMPACT ON THE WATER

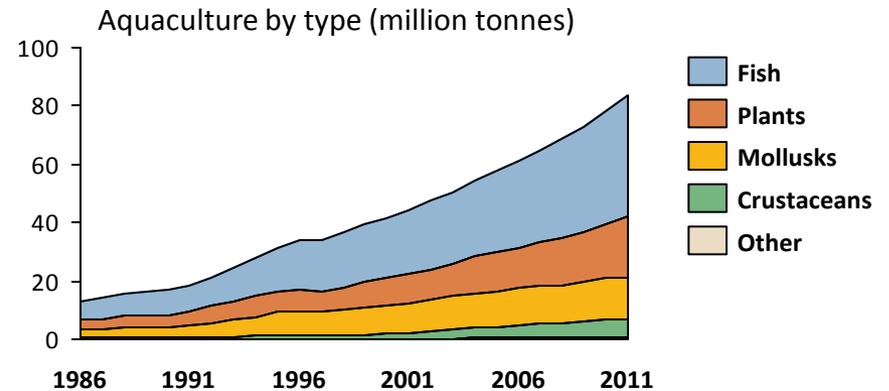
Aquaculture has become a much more significant component of the global seafood landscape and continues to grow as capture production plateaus

Aquaculture production has boomed as wild capture production has remained mostly flat, making the aquaculture sector a critical component of the global seafood value chain. Future growth is expected to continue at nearly the same pace.

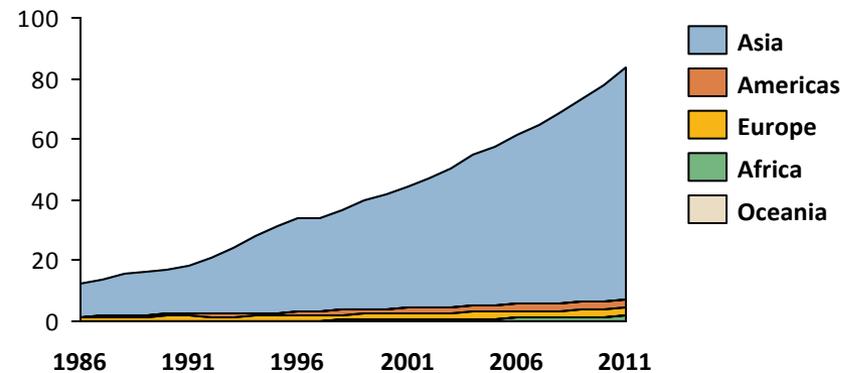
World capture fisheries and aquaculture production



Global aquaculture output



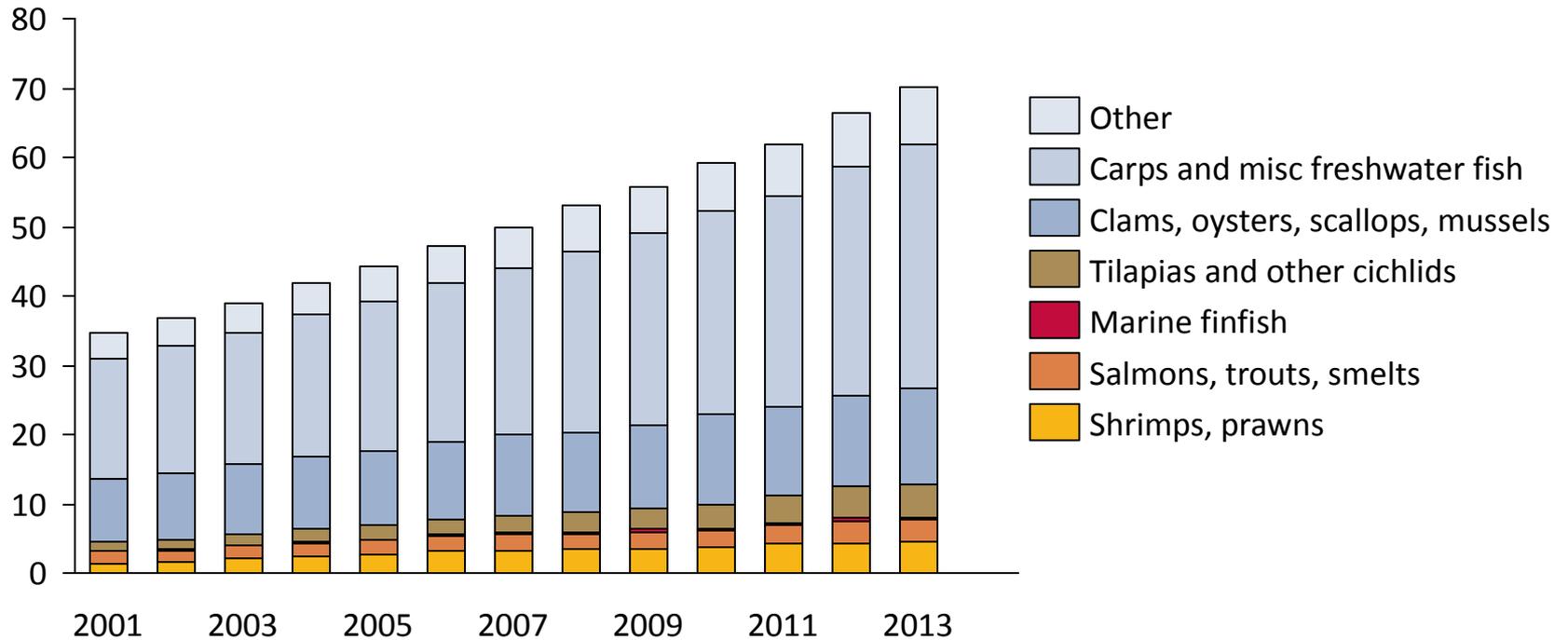
Aquaculture by continent (million tonnes)



Current aquaculture production is largely freshwater species, most of which are unimportant to, and thus uninfluenced by, western markets

Carp and other freshwater species represent the vast majority of aquaculture production. Marine finfish represent a relatively small component of overall production, though they have nearly doubled in production over the past decade. Marine finfish, salmon, and shrimp comprised roughly 11% of total aquaculture in 2013 and are the most relevant to western markets; these are also the species that consume ~55% of global fishmeal and ~75% of global fish oil.

Growth in aquaculture production by species group, 2001-2013

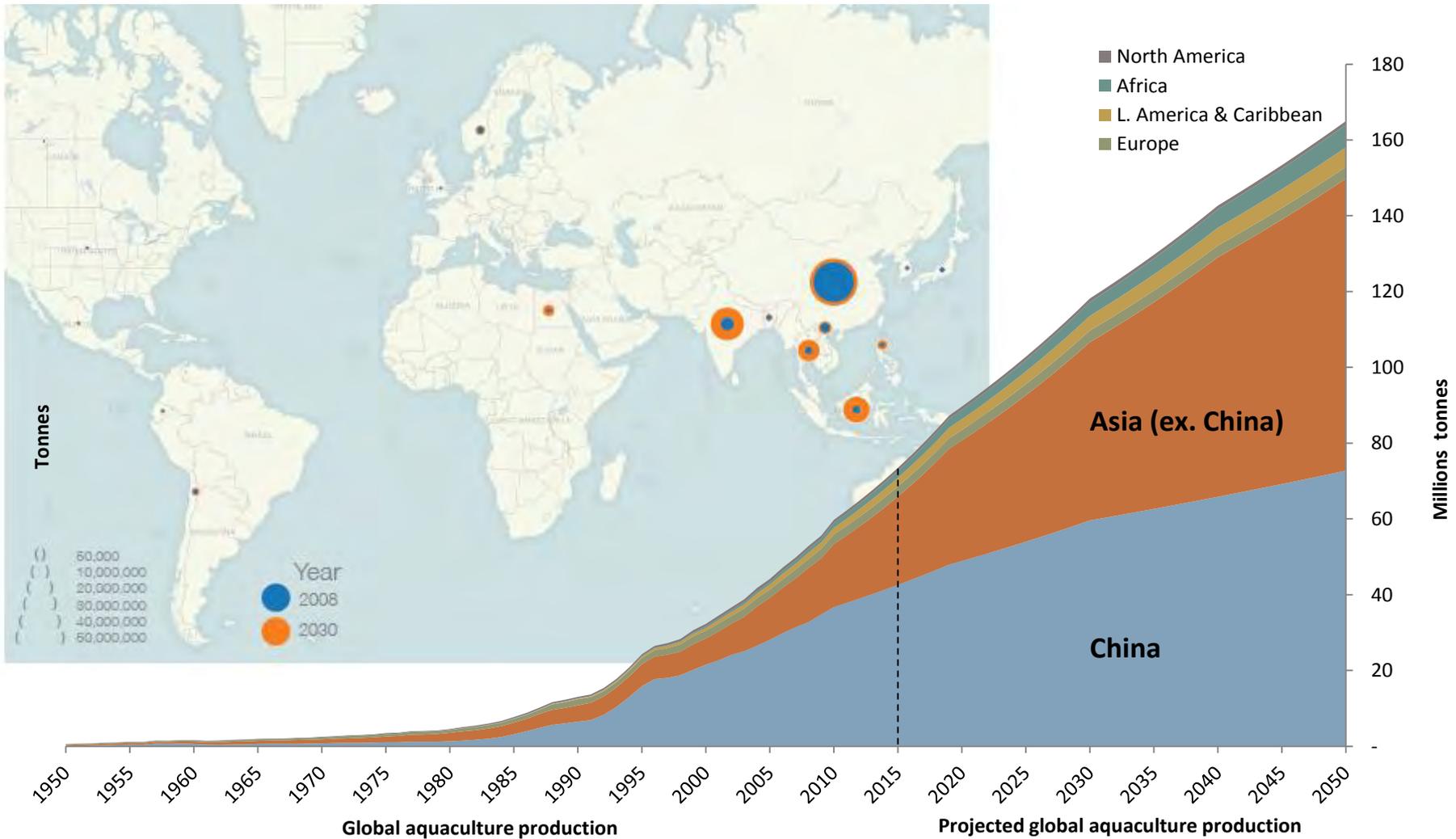


Source: FishStatJ (FAO), IFFO (World Aquaculture Society May 2008) 41, Tacon, A.G.J.; Hasan, M.R.; Metian, M. Demand and supply of feed ingredients for farmed fish and crustaceans: trends and prospects. FAO Fisheries and Aquaculture Technical Paper No. 564. FAO, 2011. 87 pp. Shepherd, C. J. and Jackson, A. J. (2013), Global fishmeal and fish oil supply: inputs, outputs and markets. Journal of Fish Biology, 83: 1046–1066. doi: 10.1111/jfb.12224

IMPACT ON THE WATER

WorldFish Center's bottom-up projections highlight continued substantial growth in Asia, particularly Southeast Asia, through 2030

Projected growth in aquaculture production, 2008-2030/2050



Source: Blue Frontiers 2012; FAO FISHSTAT. CEA projections based on regional growth trends.

PRODUCER-LEVEL PROGRESS

Producer-level progress

METRICS INCLUDED

Global status and trends in fishery health and exploitation

Certification data

Fishery Improvement Projects

GOAL: IMPACT ON THE WATER

PRODUCER-LEVEL PROGRESS

Individual producers have the capacity and support from the NGO and corporate communities to improve.

Policy timeline

E.U. policy update

U.S. policy update

Port State Measures

Key takeaways

- The number of MSC-certified fisheries has continued to increase, though MSC-certified volumes have stabilized at about 9% of global catch over recent years.
- The number of fisheries engaged in FIPs has tripled since 2012, while total catch volume engaged in FIPs is down, in part due to the dissolution of some large FIPs (e.g., Peruvian anchovy and Atlantic menhaden).
- Other certification schemes, such as Friend of the Sea, GlobalTrust, and IFFO, are less present in the market, but remain significant.
- GAA and ASC continue to grow rapidly in absolute terms, though they have remained relatively stable as a portion of global aquaculture volume; certifications still account for less than 5% of global aquaculture production combined.

Market-based interventions influence over 20% of wild-caught seafood globally; whitefish, salmon, and tuna are the most engaged commodities

Total landing volume in FIP and the MSC program by species group

	# of All FIP Fisheries† 149		# of MSC Full Assessment UoC 98		# of MSC Certified UoC 251		# of All FIP & MSC Fisheries 498	
	FIPs Only		MSC Full Assessment		MSC Certified		Total	
Total Landings in FIPs	000s Tonnes	Percent of Global Landings	000s Tonnes	Percent of Global Landings	000s Tonnes	Percent of Global Landings	000s Tonnes	Percent of Global Landings
Miscellaneous fish	29	0.1%	204	0.7%	542	1.7%	775	2.5%
Small pelagics	3,397	19.0%	405	2.3%	907	5.1%	4,709	26.3%
Whitefish	846	9.2%	647	7.0%	3,700	40.2%	5,193	56.5%
Major tuna species*	3,744	73.5%	359	7.1%	660	13.0%	4,763	93.5%
Other tunas, bonitos, billfishes	101	4.4%	1	0.1%	4	0.2%	106	4.6%
Squid	227	5.6%	48	1.2%	0	0.0%	275	6.8%
Shrimp	207	6.2%	65	2.0%	251	7.5%	523	15.6%
Molluscs	0	0.0%	66	2.6%	264	10.4%	330	13.0%
Crabs, lobsters, and crustaceans	157	5.9%	120	4.5%	176	6.6%	453	17.0%
Salmon and diadromous fish	10	1.0%	2	0.2%	473	45.5%	485	46.6%
Carps	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Sharks	0	0.0%	1	0.1%	3	0.4%	4	0.5%
Total	8,719	10.6%	1,918	2.3%	6,980	8.5%	17,617	21.5%

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.

† Landings exclude landings associated with Stage 0, Stage 1, and Stage 6 (MSC-certified) FIPs. ISSF associated landings are included. 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.

* Major tuna species include: Albacore, Bigeye, Bluefin, Little Tunny (Black Skipjack), Skipjack, and Yellowfin Tuna.

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

The number FIP fisheries has tripled since 2012; volumes have decreased due in part to the dissolution of Peru anchovy & other reduction fishery FIPs

Total landing volume in FIP and the MSC program by species group over time

2012	# of All FIP Fisheries†		# of MSC Full Assessment UoC		# of MSC Certified UoC		# of All FIP & MSC Fisheries	
	52		105		170		327	
	FIPs		MSC Full Assessment		MSC Certified		Total	
All Species	000s Tonnes	Percent of Global Landings	000s Tonnes	Percent of Global Landings	000s Tonnes	Percent of Global Landings	000s Tonnes	Percent of Global Landings
Total	10,490	11.8%	2,130	2.4%	7,080	8.0%	19,700	22.2%

2013	# of All FIP Fisheries†		# of MSC Full Assessment UoC		# of MSC Certified UoC		# of All FIP & MSC Fisheries	
	103		99		207		409	
	FIPs		MSC Full Assessment		MSC Certified		Total	
All Species	000s Tonnes	Percent of Global Landings	000s Tonnes	Percent of Global Landings	000s Tonnes	Percent of Global Landings	000s Tonnes	Percent of Global Landings
Total	12,253	15.0%	1,292	1.6%	7,807	9.5%	21,353	26.1%

2014	# of All FIP Fisheries†		# of MSC Full Assessment UoC		# of MSC Certified UoC		# of All FIP & MSC Fisheries	
	149		98		251		498	
	FIPs		MSC Full Assessment		MSC Certified		Total	
All Species	000s Tonnes	Percent of Global Landings	000s Tonnes	Percent of Global Landings	000s Tonnes	Percent of Global Landings	000s Tonnes	Percent of Global Landings
Total	8,719	10.6%	1,918	2.3%	6,980	8.5%	17,617	21.5%

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* Major tuna species include: Albacore, Bigeye, Bluefin, Little Tunny (Black Skipjack), Skipjack, and Yellowfin Tuna.

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

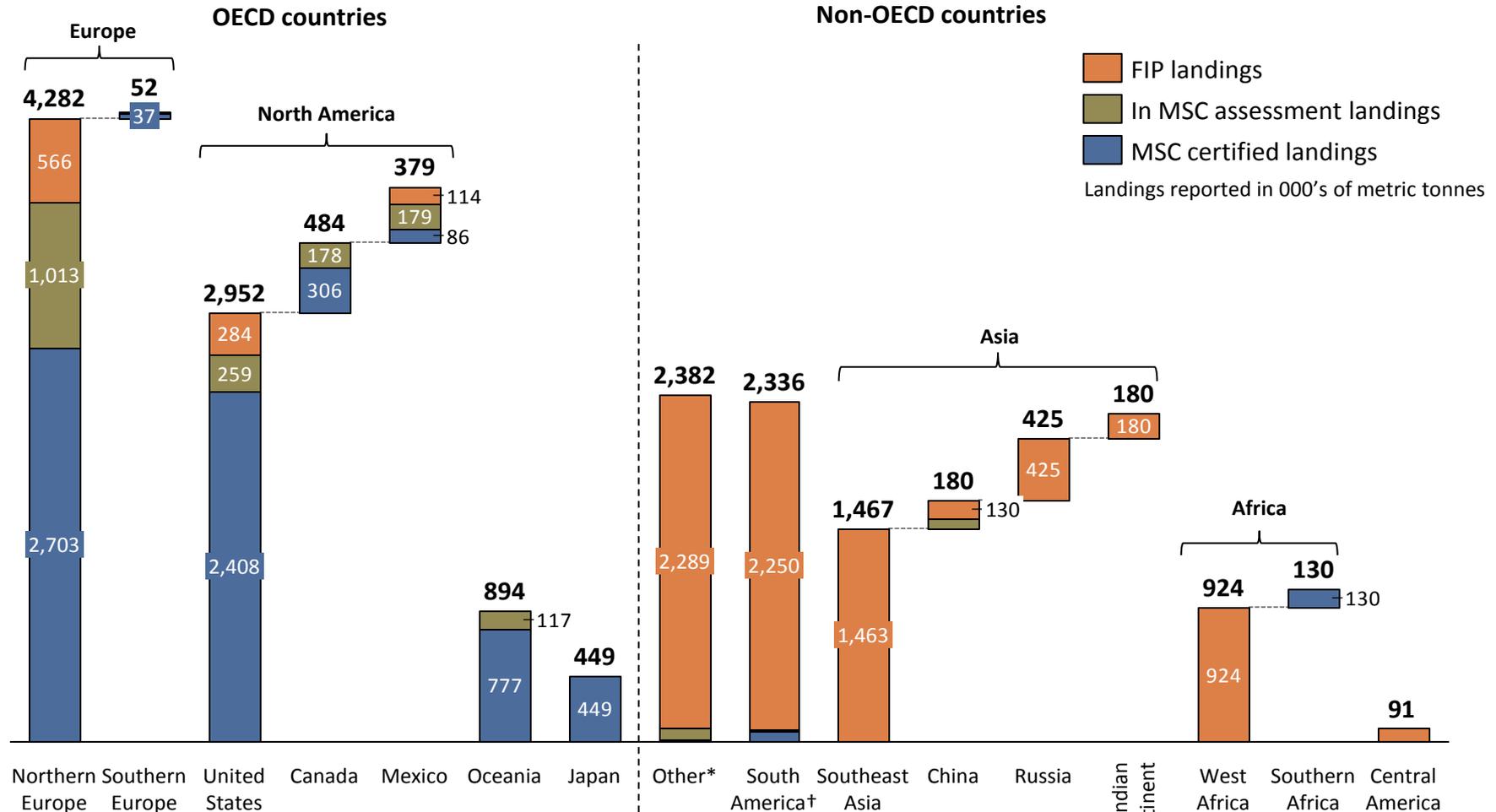
Source: CEA survey of SFP, WWF, MSC, Ocean Outcomes, ISSF, MDPI, GMRI, CeDePesca,

FisheryImprovementProjects.org, FishStatJ

PRODUCER-LEVEL PROGRESS

While Europe and North America have more MSC-certified landings, the rest of the world has more landings in FIPs

Global landings engaged in sustainable seafood interventions[‡]



‡ - 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.

Source: CEA survey of SFP, WWF, MSC, Ocean Outcomes, ISSF, MDPI, GMRI, CeDePesca, FisheryImprovementProjects.org, FishStatJ

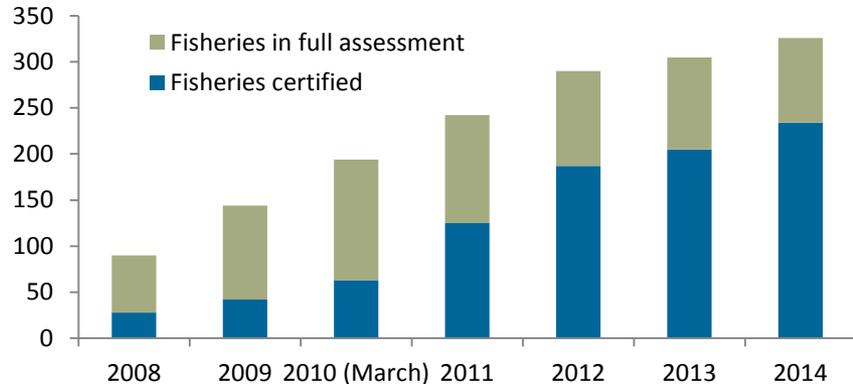
*Primarily ISSF associated landings that extend beyond the jurisdiction of a single country

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

PRODUCER-LEVEL PROGRESS

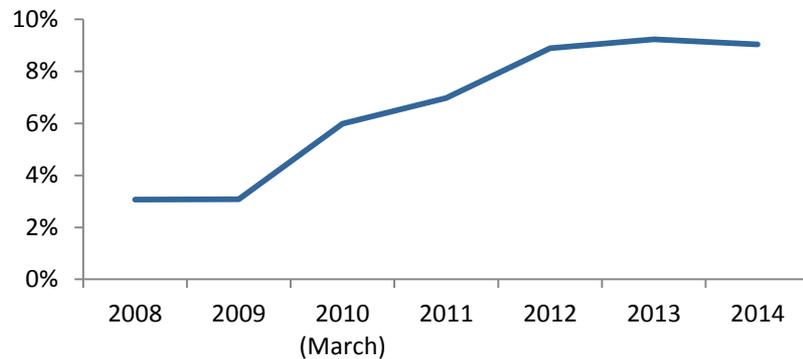
The number of MSC-certified fisheries continues to increase, though certified volume has remained roughly constant for three years

MSC-certified fisheries and fisheries in full assessment



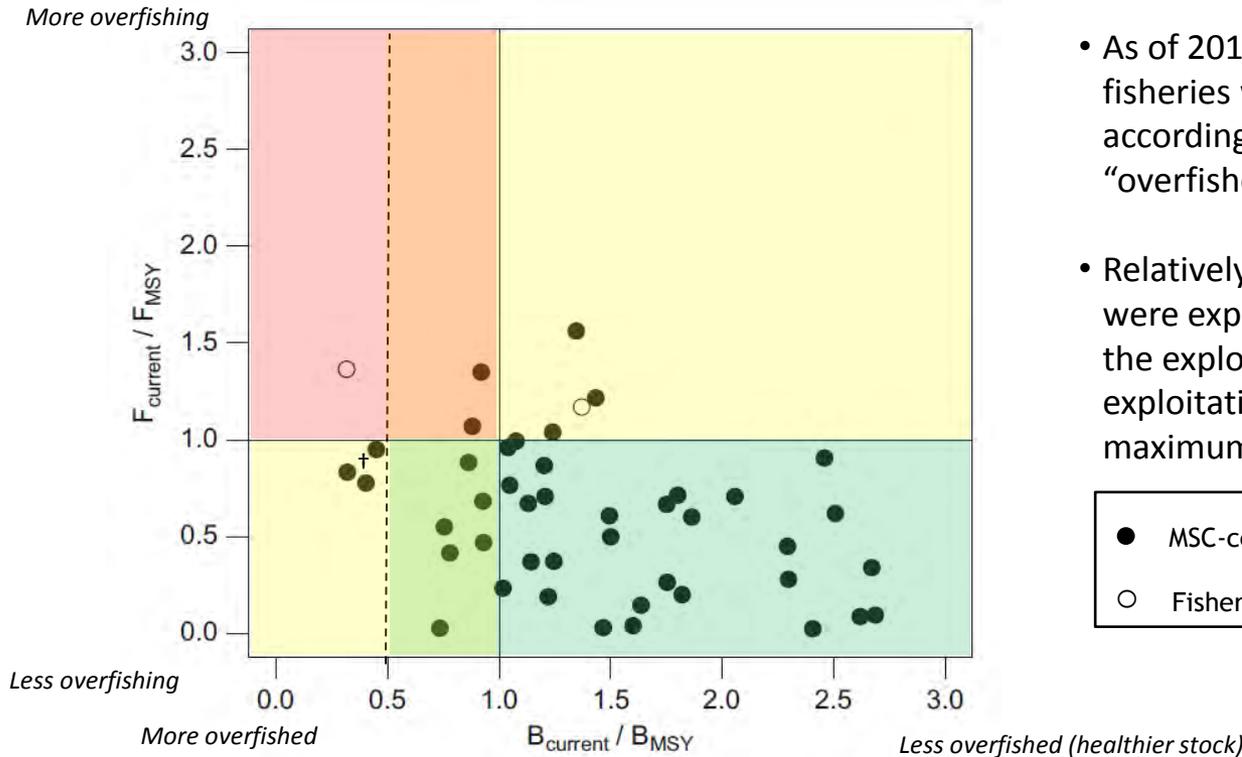
- The number of certified fisheries and fisheries in full assessment has more than tripled since 2008.
- MSC certification covers approximately 9% of all wild catch fish by volume (10% when fisheries in full assessment are included.) Despite certifying about 30 additional fisheries in 2014 compared to 2013, the total *volume* of certified fish dropped slightly for the first time.

MSC-certified volume as % of total wild catch

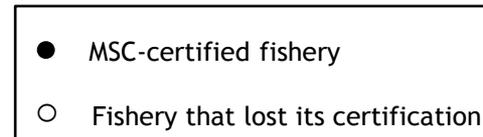


PRODUCER-LEVEL PROGRESS

MSC-certified fisheries are generally well-managed and maintain stocks at sustainable levels of biomass and fishing pressure



- As of 2012, almost no MSC-certified fisheries were considered overfished, according to common definitions of “overfished” ($B < B_{lim}$ or $B/B_{MSY} < 0.5$)
- Relatively few MSC-certified fisheries were experiencing “overfishing” (where the exploitation rate, F , exceeds the exploitation rate associated with maximum sustainable yield.)

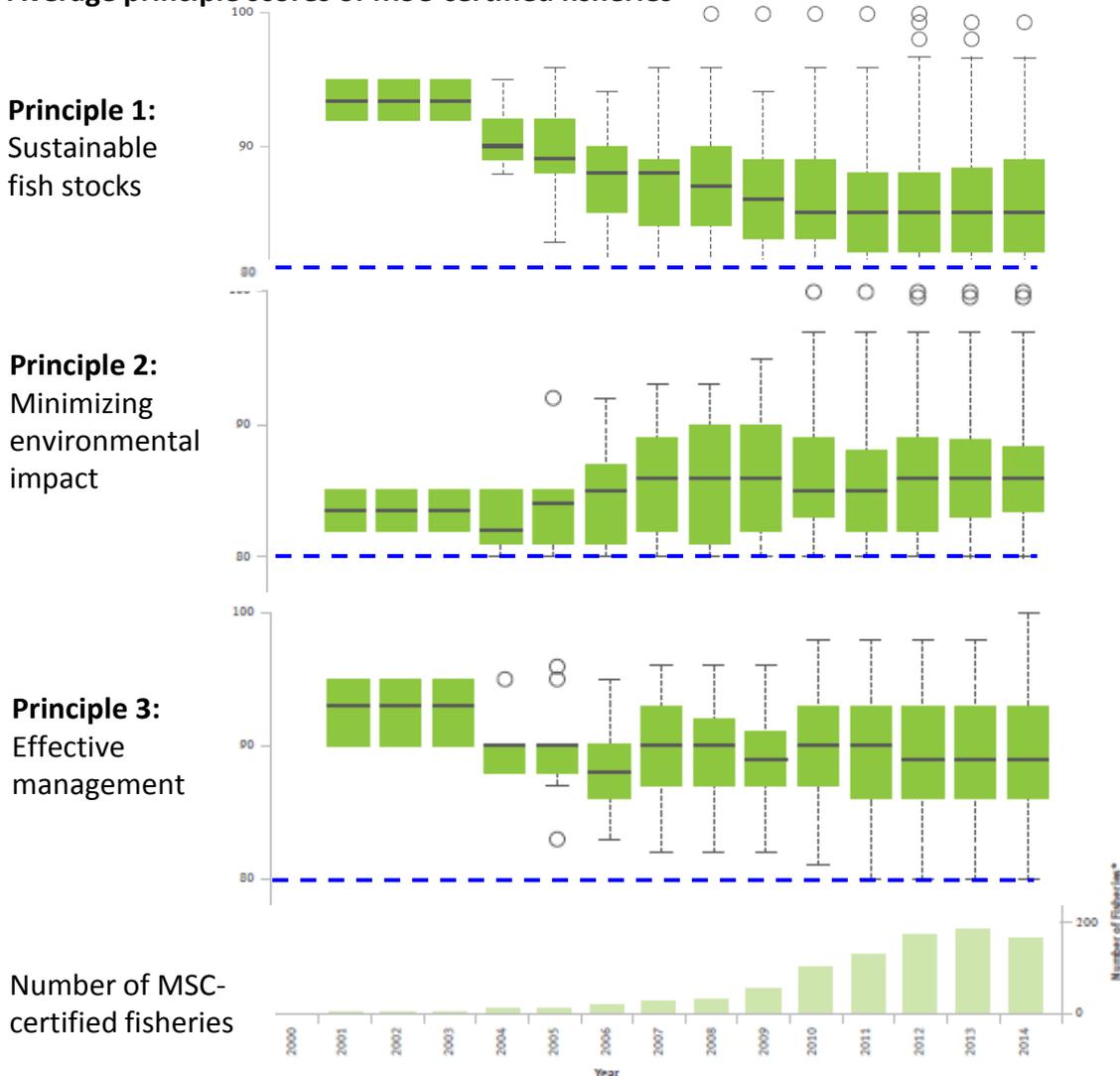


† Although B / B_{MSY} is less than 0.5 for three stocks (the standard default value for defining an “overfished” stock) it is still above B_{lim} as determined for these specific stocks. Thus, the authors argue that none of the MSC-certified stocks are overfished, and relatively few are experiencing overfishing ($F_{current} / F_{msy} > 1$).

PRODUCER-LEVEL PROGRESS

MSC-certified fisheries are generally well-managed and maintain stocks at sustainable levels of biomass and fishing pressure

Average principle scores of MSC-certified fisheries

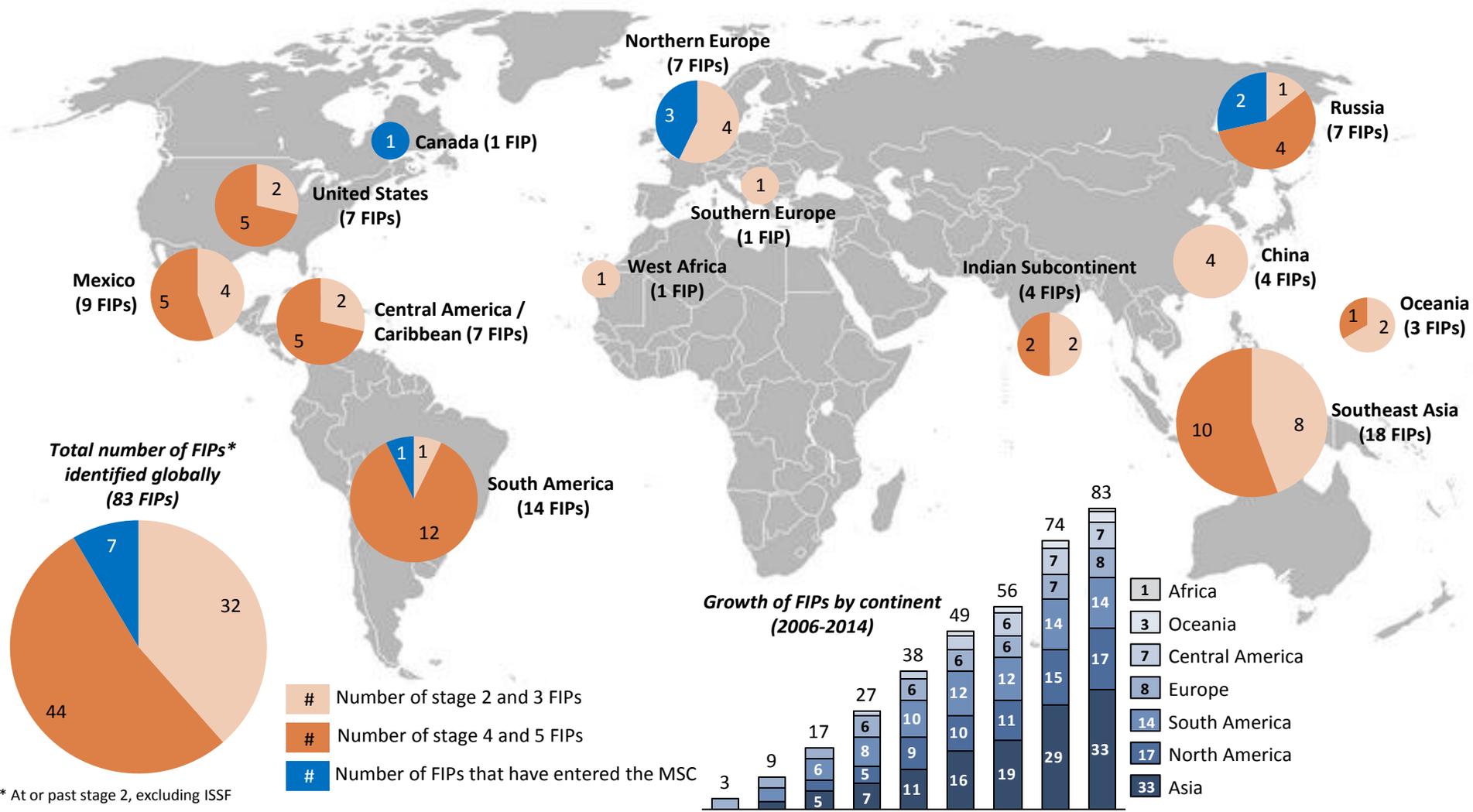


- In general, the principle scores of MSC-certified programs across sustainable fish stocks, for minimizing environmental impact, and for effective management have remained stable over recent years; all are above a level of global best practice (score of 80; blue dotted line in charts).
- At the same time, the number of MSC-certified fisheries has increased (bottom graph), changing the composition of the fisheries being measured. Recently-added stocks have been certified with lower scores (particularly for Principle 1), dragging down the annual average scores and masking improvement trends within fisheries that have been certified for multiple years.

Graphs show: Median, interquartile range, and maximum and minimum scores of certified fisheries at time of certification.

PRODUCER-LEVEL PROGRESS

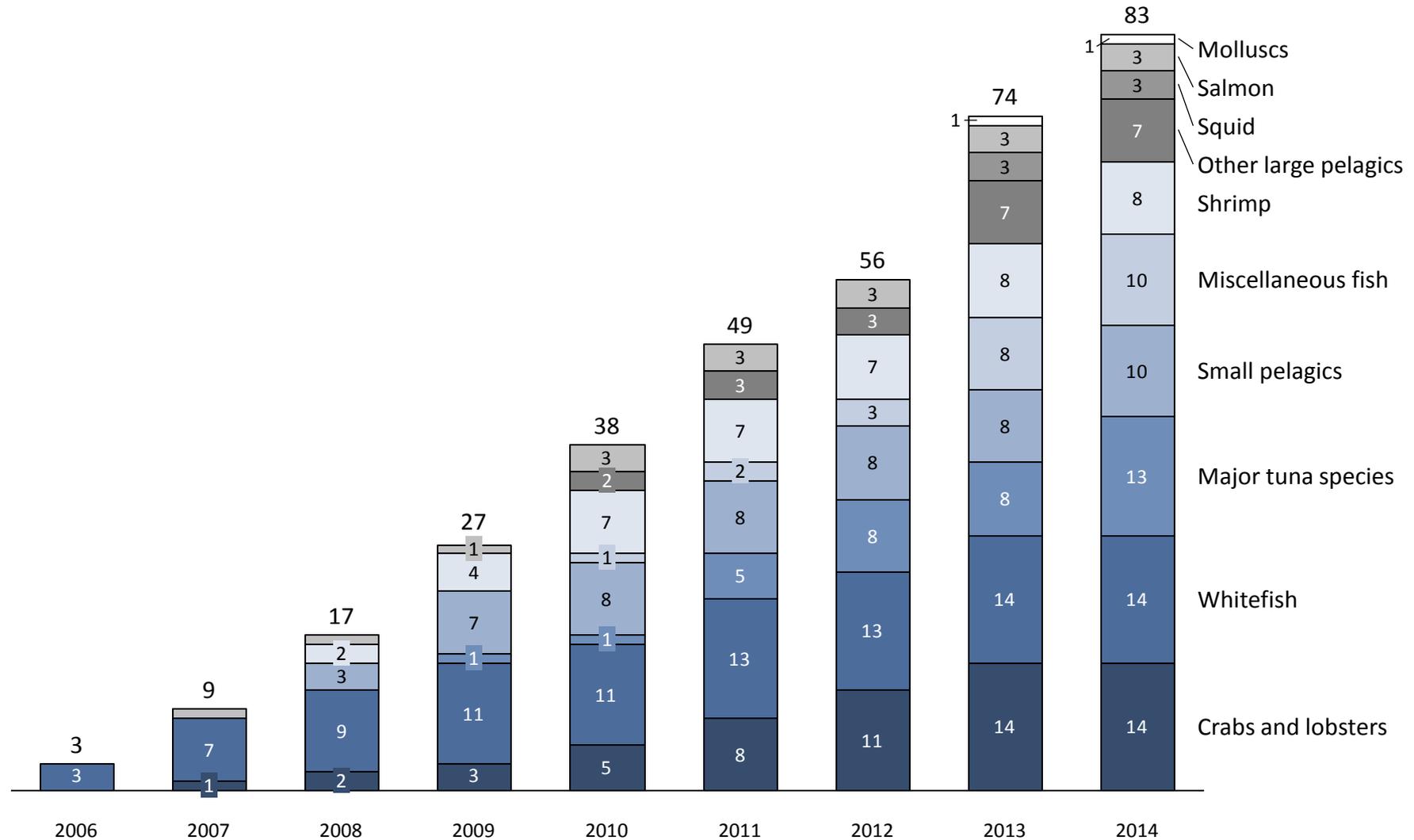
Fishery Improvement Projects (FIPs) continue to grow in popularity worldwide; FIPs proliferated most quickly in Southeast Asia in recent years



* At or past stage 2, excluding ISSF

PRODUCER-LEVEL PROGRESS

FIPs have engaged fisheries in most major seafood commodities in roughly equal numbers after an early concentration in whitefish



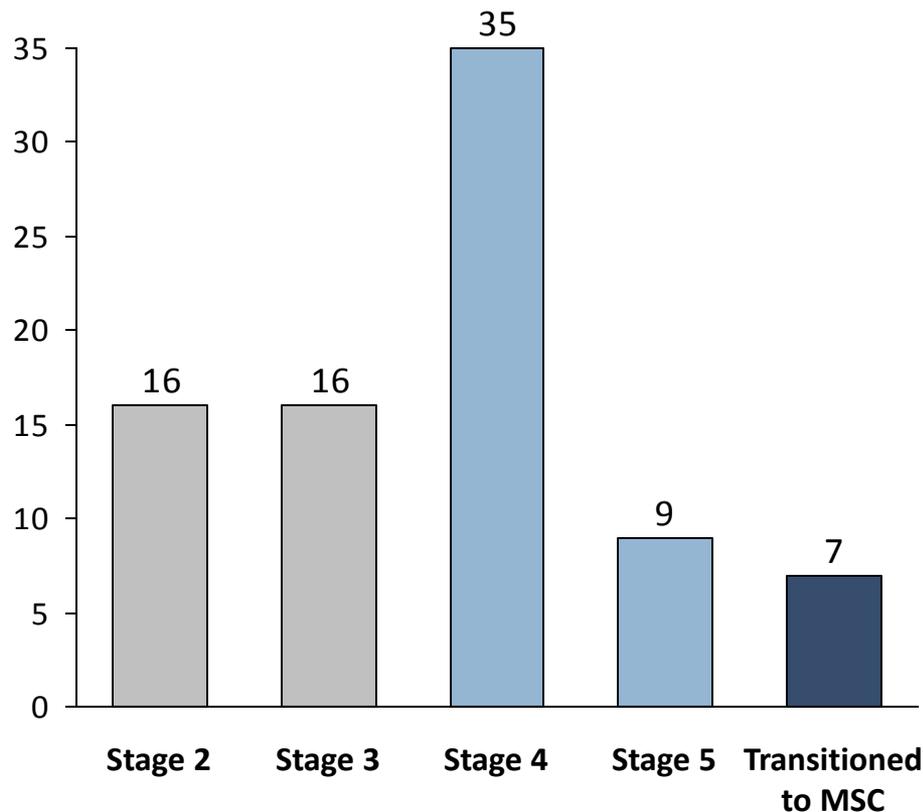
* Excluding ISSF

PRODUCER-LEVEL PROGRESS

While some of the first generation of 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



* Excluding ISSF

Stage 5 FIPs (9)

- Vietnam blue swimming crab
- Nicaragua spiny lobster
- Bahamas spiny lobster
- Indonesia national tuna
- Ecuador mahi
- Argentina hake
- Gulf of Mexico FL pink shrimp
- Gulf of Mexico grouper
- Gulf of Mexico red snapper

FIPs that have entered MSC (7)

- Argentina hoki
- Baltic cod
- Barents Sea cod and haddock
- Eastern Canadian cod
- Russian pollock
- Sakhalin Island pink salmon
- Western Kamchatka salmon

Other eco-labels have also certified a number of fisheries globally



- 91 fisheries have been “found to be compliant” with Friend of the Sea Sustainable Fisheries criteria, up from 87 in 2013.
- 35 different species’ (down from 39 in 2013) fisheries have been found compliant, including anchovies, cod, grouper, lobster, salmon, sharks, swordfish, and tuna.
- Friend of the Sea also certifies aquaculture producers, and has certified ~100 of 150 applicants, double the number from two years ago.
- Friend of the Sea labels more than 1,000 products (up from 600 in 2013) primarily offered in Europe, but labeled products can be found in the U.S., Hong Kong, and Singapore as well.



Fairtrade standards for Capture Fisheries were finalized in 2014 and cover fishery prices and wages, working conditions, and fishery environmental criteria. Fishers are guaranteed a price premium on Fairtrade fish, as well as investments in community development. The program certified its first fishery – Moluccan (Indonesia) handline yellowfin tuna – in 2014.



Global Trust has developed two eco-certifications– Alaskan Fisheries Certification and Icelandic Fisheries Certification–under which it has certified eleven fisheries against FAO-standards based guidelines for responsible fisheries management.



Icelandic Fisheries Certification: cod, haddock, saithe, golden redfish



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

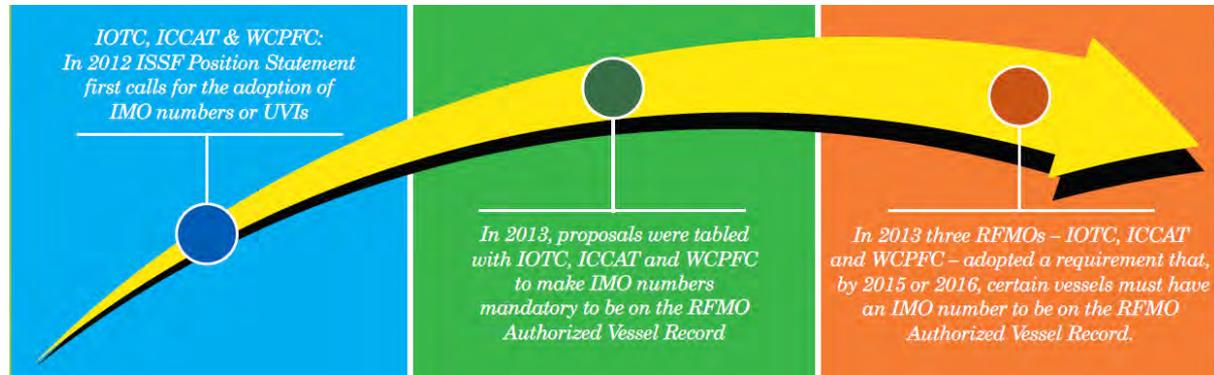
PRODUCER-LEVEL PROGRESS

The International Seafood Sustainability Foundation (ISSF) has been propelling policy change on tuna

The International Seafood Sustainability Foundation (ISSF) was created in 2009 as a partnership between the tuna industry, scientists, and the World Wide Fund for Nature.

- The foundation primarily engages in advocacy and dialogue at the Regional Fisheries Management Organization (RFMO) level.
- ISSF's work has helped propel progress on both IMOs and Fisheries Aggregation Devices (FADs) (see progress at right).
- ISSF publishes an annual report called *The Status of the World Fisheries for Tuna*; the report determines the health of the 19 tuna stocks that support commercial fishing.

Use of vessel identification (via IMO numbers or UVIs) has increased rapidly among purse-seine tuna vessels



At the end of 2011, 12% of large-scale purse seine tuna vessels had a publically known IMO number. As of the end of 2013, 88% did.

As of 2013, three RFMOs had issued recommendations around the use of Fisheries Aggregation Devices (which lead to bycatch) by purse-seine tuna vessels

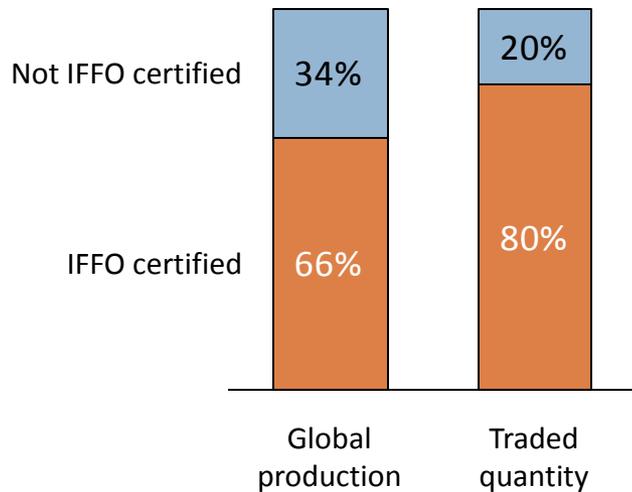


Tuna from fisheries where ISSF engages on the RFMO level may or may not be considered to be part of a FIP; for the purposes of this report, they are counted as within a FIP.

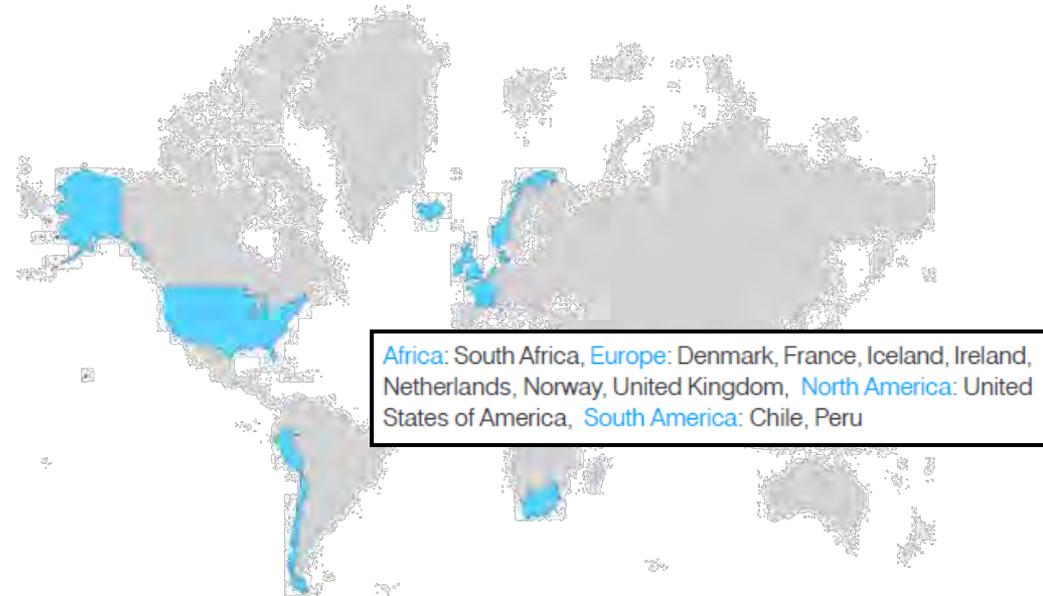
PRODUCER-LEVEL PROGRESS

Fishmeal and fish oil producers have chosen IFFO RS as their sustainability standard of choice, which is accepted by aquaculture certifications

Most fishmeal and fish oil is IFFO certified



Geographic scope of IFFO RS certified plants

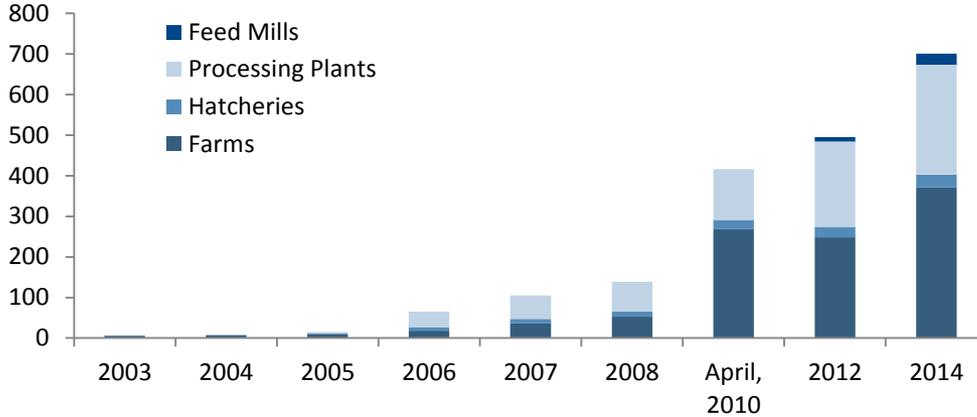


- International Fishmeal and Fish Oil Organization (IFFO) Responsible Supply (RS) certifies processors globally against their own sustainability standards.
- Two thirds of global fishmeal and fish oil production is now certified. No plants in Asia are certified.
- IFFO RS requires that a processor meet the following:
 - Sources its whole-fish raw material from FAO Code of Conduct for Responsible Fisheries
 - Avoids use of IUU fish and by-products of IUCN-red-listed fish
 - Manufactures under a quality control scheme to ensure product safety, purity, and traceability
- More than 100 plants in 10 countries are certified under IFFO RS standard.

PRODUCER-LEVEL PROGRESS

The number of Global Aquaculture Alliance-certified farms and amount of certified volume continues to increase each year

GAA certified farms, hatcheries, feed mills and processing plants



- The number of GAA certified farms has increased fourfold since 2008.
- GAA certified seafood has increased its market share of total global farmed seafood to slightly more than 1% of the aquaculture market. Processing plants handling 2% of global aquaculture are GAA certified.

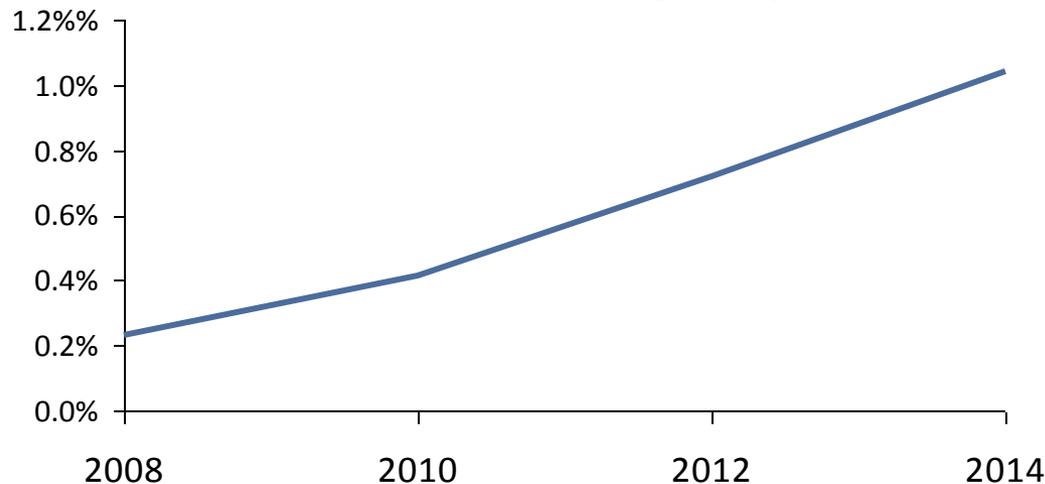
- GAA has developed standards for*:

- Shrimp
- Catfish
- Tilapia
- Pangasius
- Salmon
- Rainbow trout
- Barramundi
- Mussels



- A higher percentage of salmon, shrimp, and tilapia are certified, whereas there is less coverage for catfish and pangasius.

GAA certified farm volume as share of global aquaculture



PRODUCER-LEVEL PROGRESS

The Aquaculture Stewardship Foundation is also scaling rapidly, having increased the number of certified farms fourfold in 18 months

ASC has scaled rapidly since its entry into the space a few years ago, adding additional standards and farms. However, total certified product volume remains relatively small (~0.6% of global aquaculture production).



Scale and reach of ASC	March 2013	Oct. 2014
Number of certified farms	26	104
Number of supplier countries	6	14
Number of countries with sales of ASC products	10	40
Number of chain of custody certified companies	134	415

Standards, Certification, and Accreditations

- ASC Standards:
 - Pangasius
 - Tilapia
 - Salmon
 - Trout
 - Abalone
 - Bivalve
 - Shrimp
- Chain of Custody Certification (partnership with MSC)
- Farm certification and accreditation

Trade dynamics

Key takeaways

- The quantity of globally traded high-value seafood has boomed. Markets beyond the U.S., the E.U., and Japan – especially South and Southeast Asian markets– are increasingly importing seafood, although in some cases the product is destined for re-export.
- The U.S., Canada, and much of Northern Europe are strong sustainable seafood markets currently; expansion to Southern Europe and Japan would contribute significant additional market demand.

M
Glo

Fishery Improvement Projects

Individual producers have the capacity, and support from the NGO and corporate communities, to improve

E.U. policy update

U.S. policy update

Traceability

Seafood trade flow data

Key commodity trade flow trends

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.

POLICY CHANGE

A combination of advocacy and 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

Media and literature penetration

Industry event attendance

U.S. seafood consumption

Consumer interest and preferences

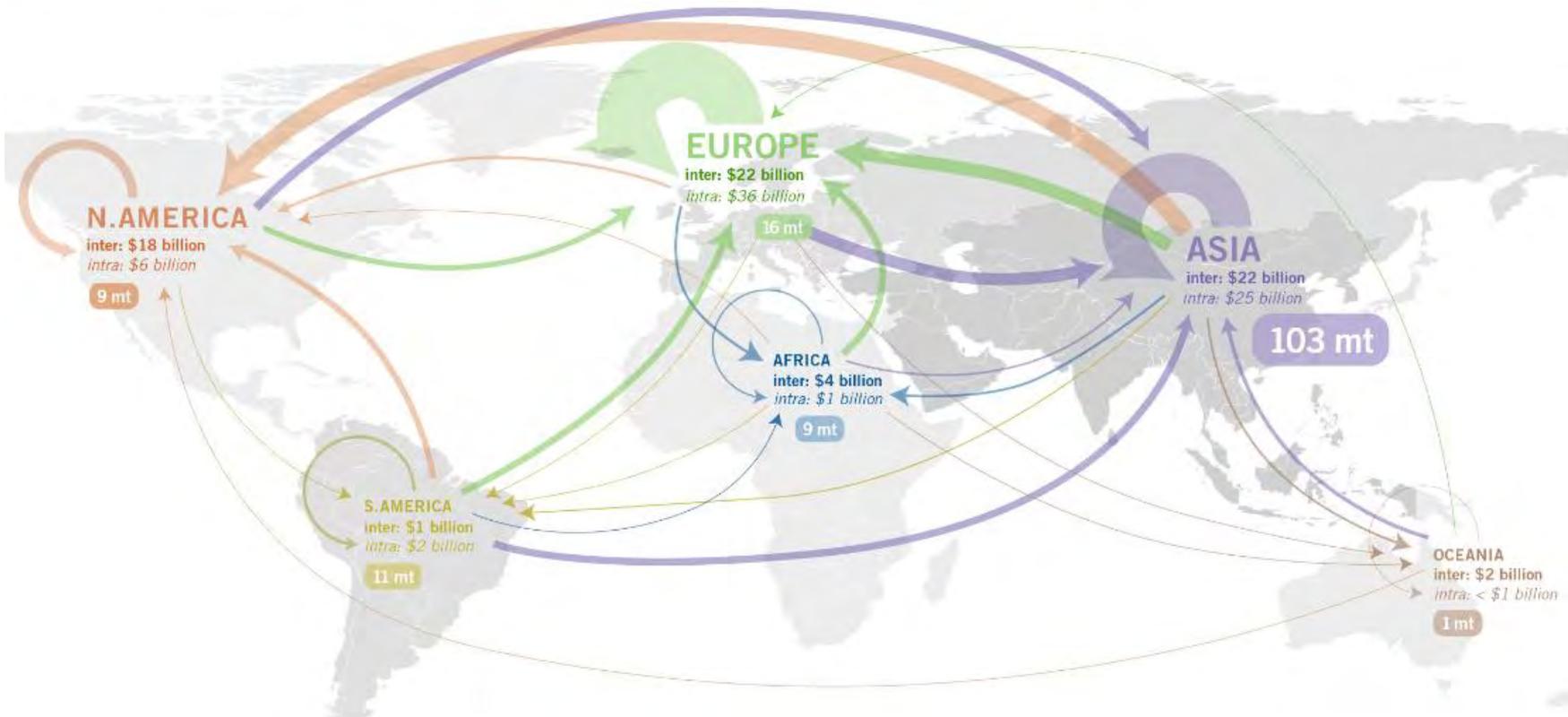
Enabling businesses and initiatives

CONDITIONS FOR BUSINESS CHANGE

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

TRADE DYNAMICS

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



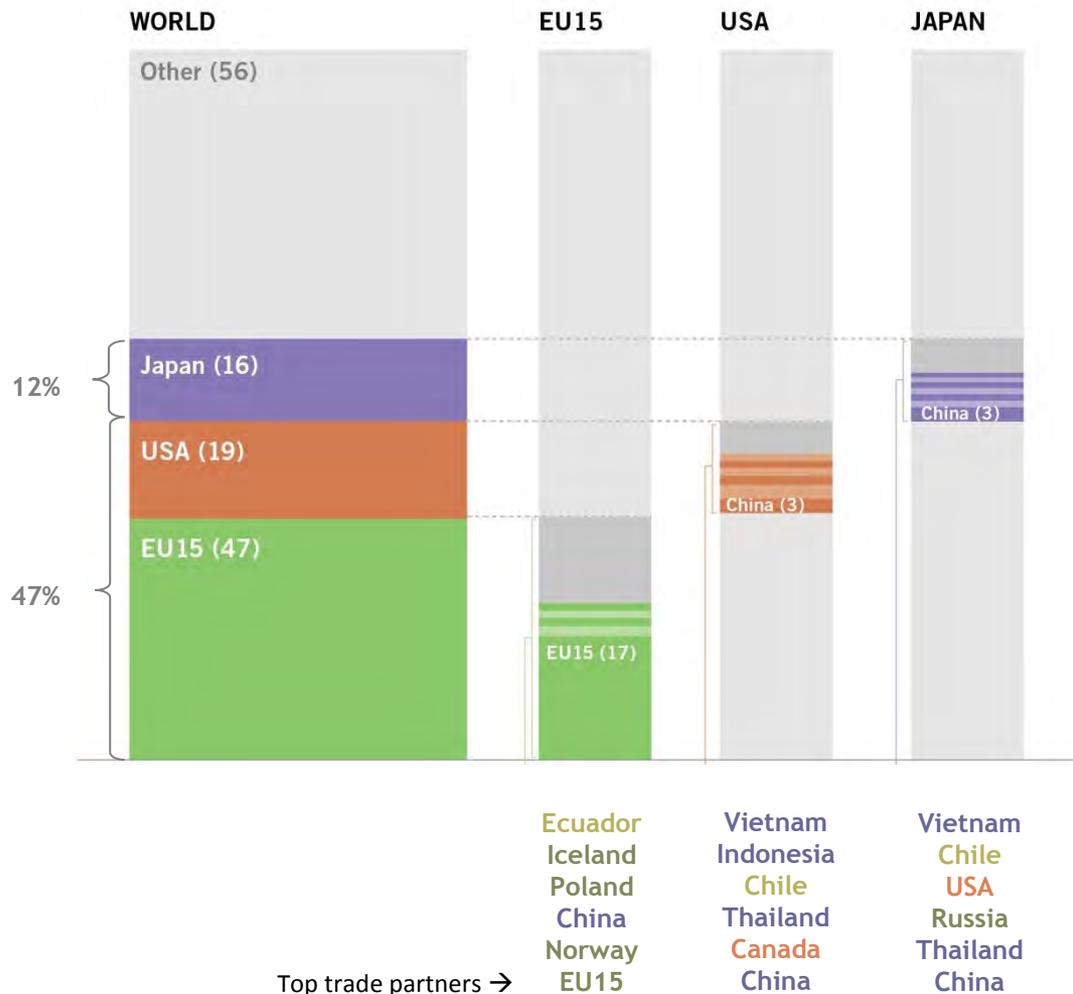
- **Substantial international trade broadcasts demand for sustainable seafood globally:** 37% of global seafood volume is traded internationally, which makes seafood more highly traded than sugar (34%), wheat (19%), beef (13%), or poultry (12%). These trade dynamics are the mechanisms through which North American and European demand and market leverage is transmitted to the countries and fisheries in need of reform.
- **Intra-regional trade reduces opportunities for further expansion:** More than 60% of the seafood imports into European countries come from other European countries, reducing its potential demand to countries in greater need of reform. 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 outside of a few key commodities.

TRADE DYNAMICS

The United States and the EU15 account for ~47% of global seafood imports; Japan accounts for an additional 12%

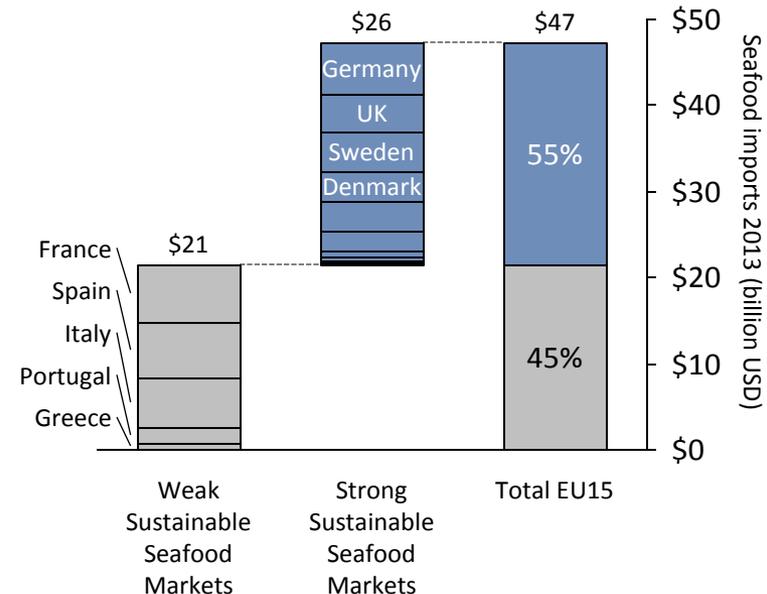
TOP IMPORT VALUES

(billions of USD) Top trade partners highlighted.



- The United States and EU15, where sustainable seafood markets are most developed, account for 47% of global seafood imports by value.
- Japan, a country that is commonly identified as a next logical target for cultivating sustainable seafood markets, accounts for an additional 12% of global seafood markets. Although, the bulk Japan's imports is confined to shrimp and tuna.
- Southern Europe is also a logical target for further demand-side cultivation.

Imported value of seafood for EU15 member countries



When discussing the potential scale of sustainable seafood, it is important to understand the limits of the model as it currently exists

The demand for “sustainable” seafood remains largely limited to the U.S. and Northern Europe, which together account for roughly a third of imported seafood globally

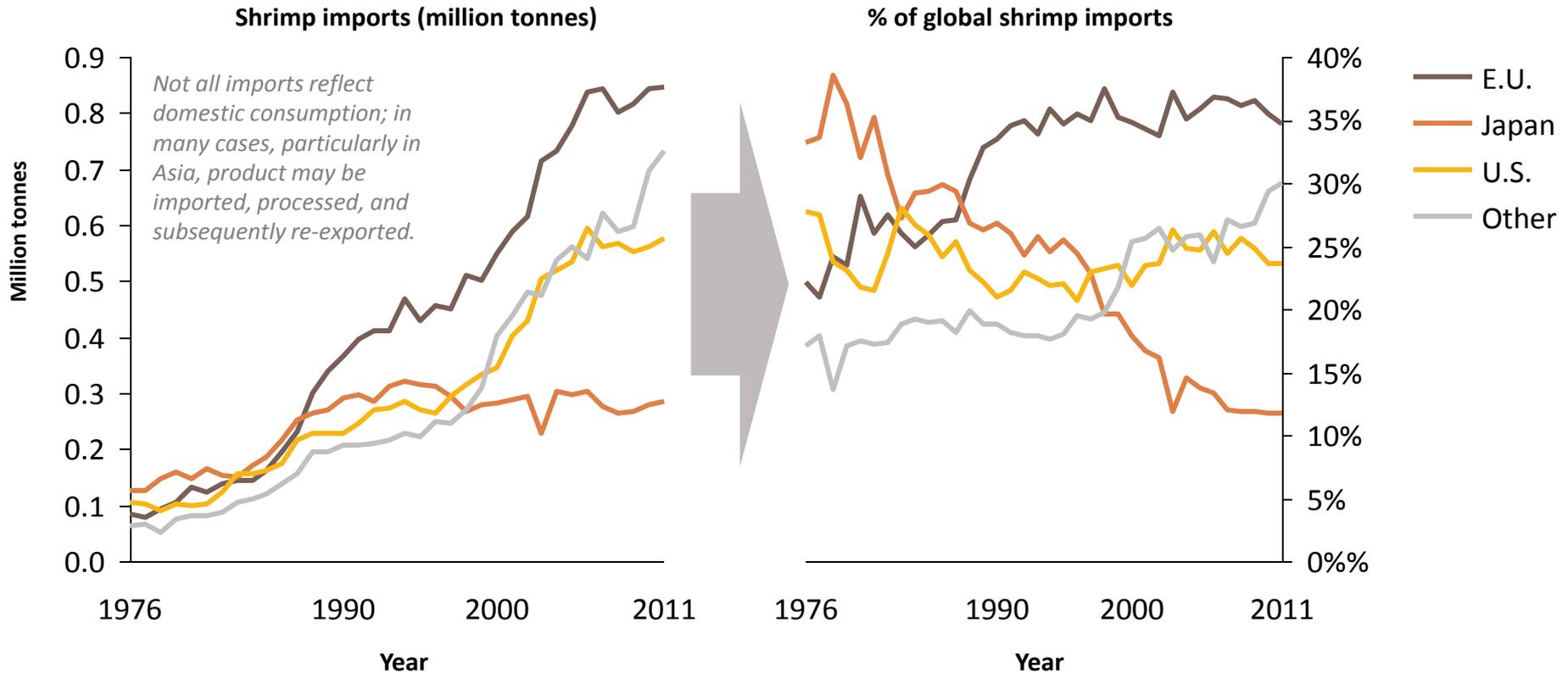
- The reach of market-based conservation interventions extends only as far as the demand for sustainable seafood. Currently that demand resides mainly in Northern Europe, North America, and Oceania, which account for roughly 32% of global imports by value.
- This future import demand pressure is somewhat limited 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:

- **Whitefish:** Limited expansion opportunity given wide adoption of MSC and FIPs already
- **Salmon:** Limited expansion opportunity given wide adoption of MSC and FIPs already
- **Lobster:** A few *good* candidates for additional lobster engagement remain; achieving impact in existing FIPs (e.g., in Brazil) may be more impactful than expanding to new fisheries
- **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
- **Small pelagics:** Industry has settled on IFFO RS as the sustainability bar, which covers ~80% of small pelagic volume
- **Tuna:** ISSF has strong coverage of tuna; potential gains could be made by improving coordination of all sustainability efforts
- **Squid:** Market programs have not had much traction with squid fisheries
- **Octopus:** Market programs have not had much traction with octopus fisheries
- **Shrimp:** Cold water shrimp is largely certified and should not be a focus for conservation organizations, while progress in tropical shrimp fisheries remains elusive; market pressure is thus far insufficient for the scale of difficulty these fisheries
- **Snapper/grouper:** Difficult context to achieve short or medium-term success

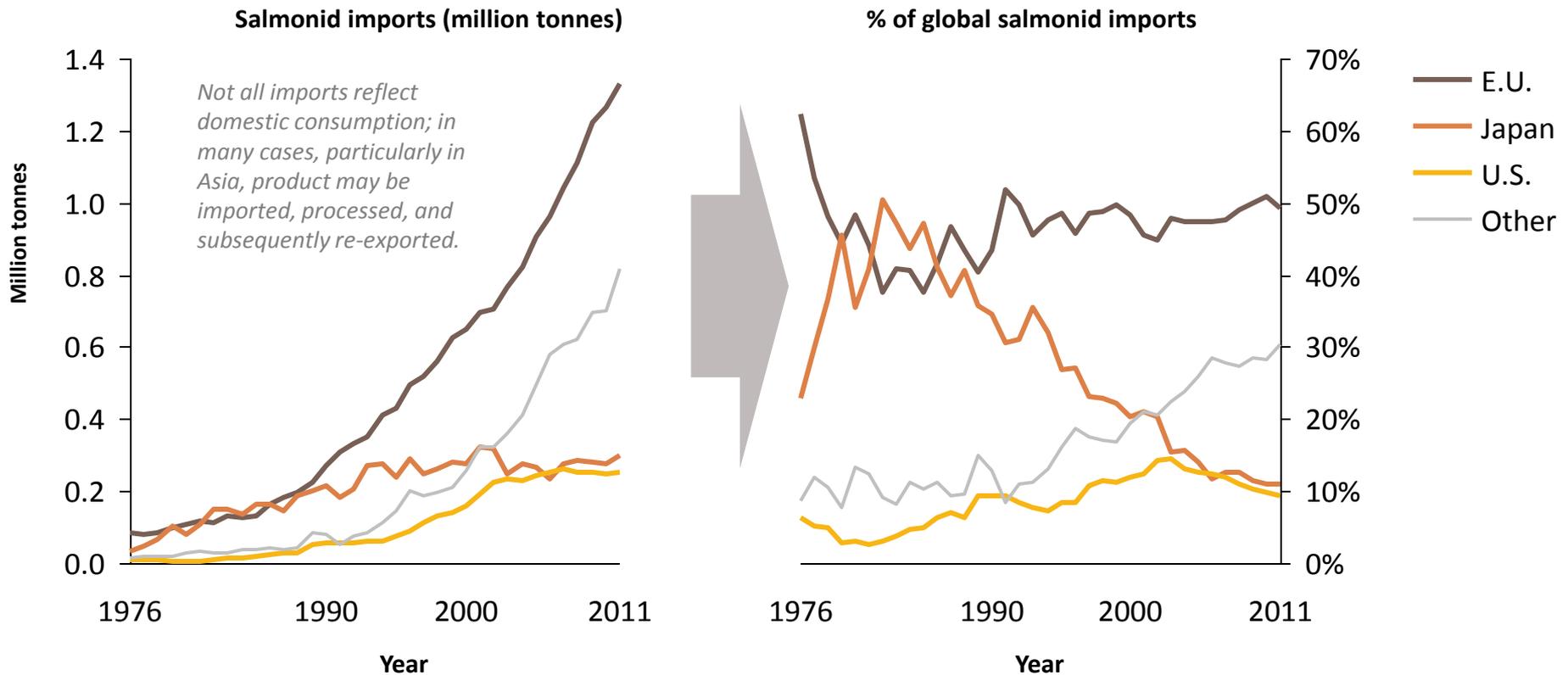
Commodity of particular interest – shrimp

Combined, the U.S., E.U., and Japan import more than 70% of globally traded shrimp. As a percentage of global imports, the E.U. and U.S. together have remained largely stable at about 60% of the market. In absolute terms, imports into both the E.U. and U.S. have risen significantly over the last decade even as Japan’s imports have leveled off. There are signs that Western demand for shrimp is plateauing.



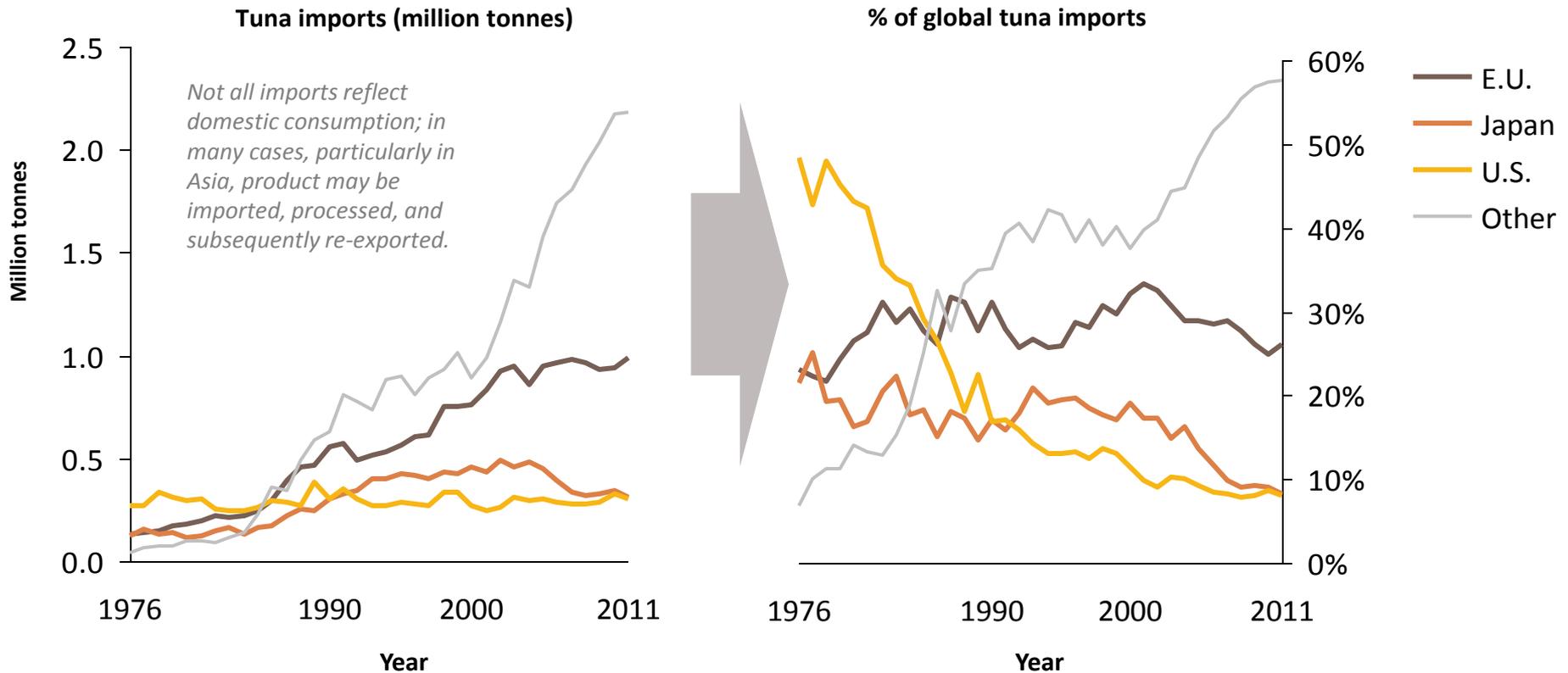
Commodity of particular interest – salmonids

Farmed salmon has helped spur a boom in the international salmon trade. Although E.U. imports of salmonids have skyrocketed over the last decade, they have remained stable at 50% of global salmon imports, in part because the rise of farmed salmon (especially in Chile and Norway) has led to a boom in the amount of salmon traded globally. Together, the three regions shown below account for 70% of global imports.



Commodity of particular interest – tuna*

E.U. tuna imports have skyrocketed in recent decades. However, imports have slightly dropped in the past five years or so. Japanese tuna imports are also down over the past decade, and U.S. imports are flat. With greater global trade in tuna, these three regions accounted for only 43% of imports in 2009 after accounting for 93% of imports in 1976. This may reflect the rise in processing and re-exporting of seafood in countries like Thailand and China.



* Included bonitos and billfish
Source: FAO FishStat

Business relationships

Key takeaways

- In North America and Europe, most major retailers have sustainable seafood commitments governing wild-caught seafood. Commitments to aquaculture are less well developed, primarily due to the relative youth of aquaculture certifications and improvement projects.
- Retailers continue to improve on measures such as Greenpeace’s “State of the Oceans” scorecard.
- An increasing number of fast food chains are selling MSC-certified pollock.
- Companies within the U.S. supply chain are now working together to support sustainability by making commitments and pooling resources to support improvement projects.

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.

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

considered an area of NGO focus.

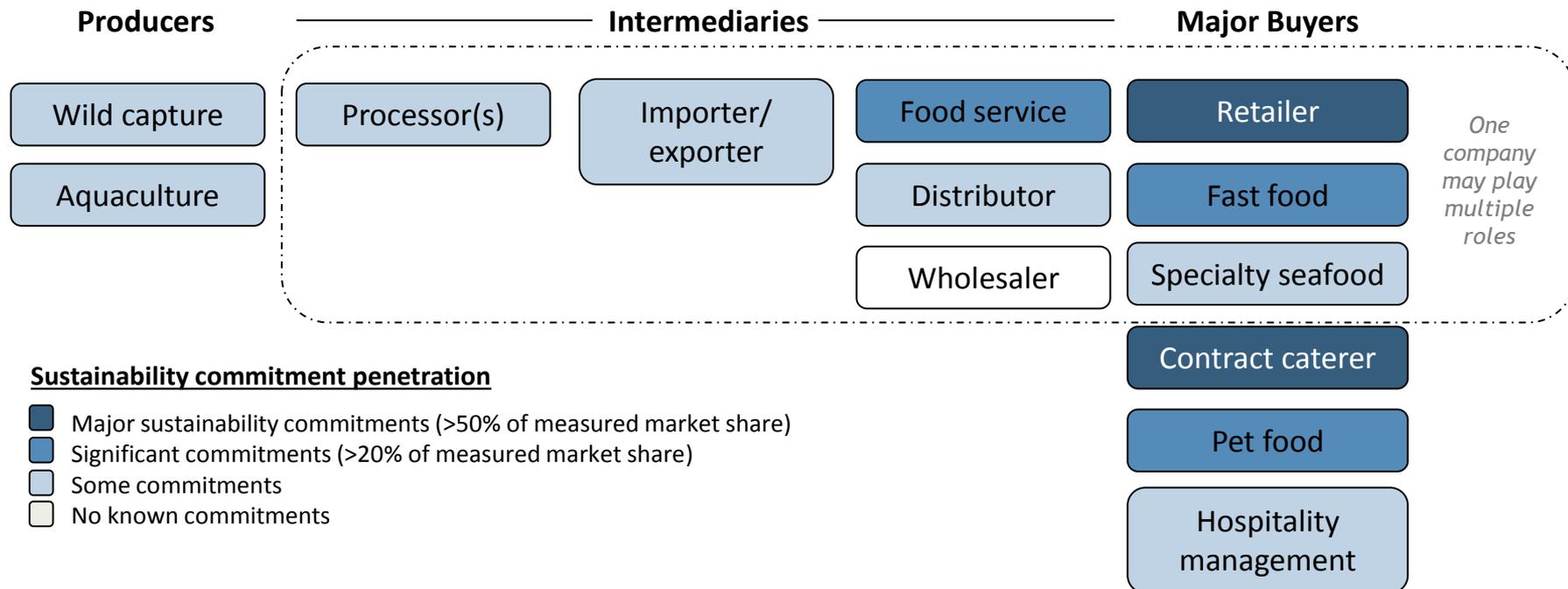
Corporate- NGO partnerships
Greenpeace’s scorecard data

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

BUSINESS RELATIONSHIPS

A wide range of buyers have made sustainable seafood commitments throughout the supply chain

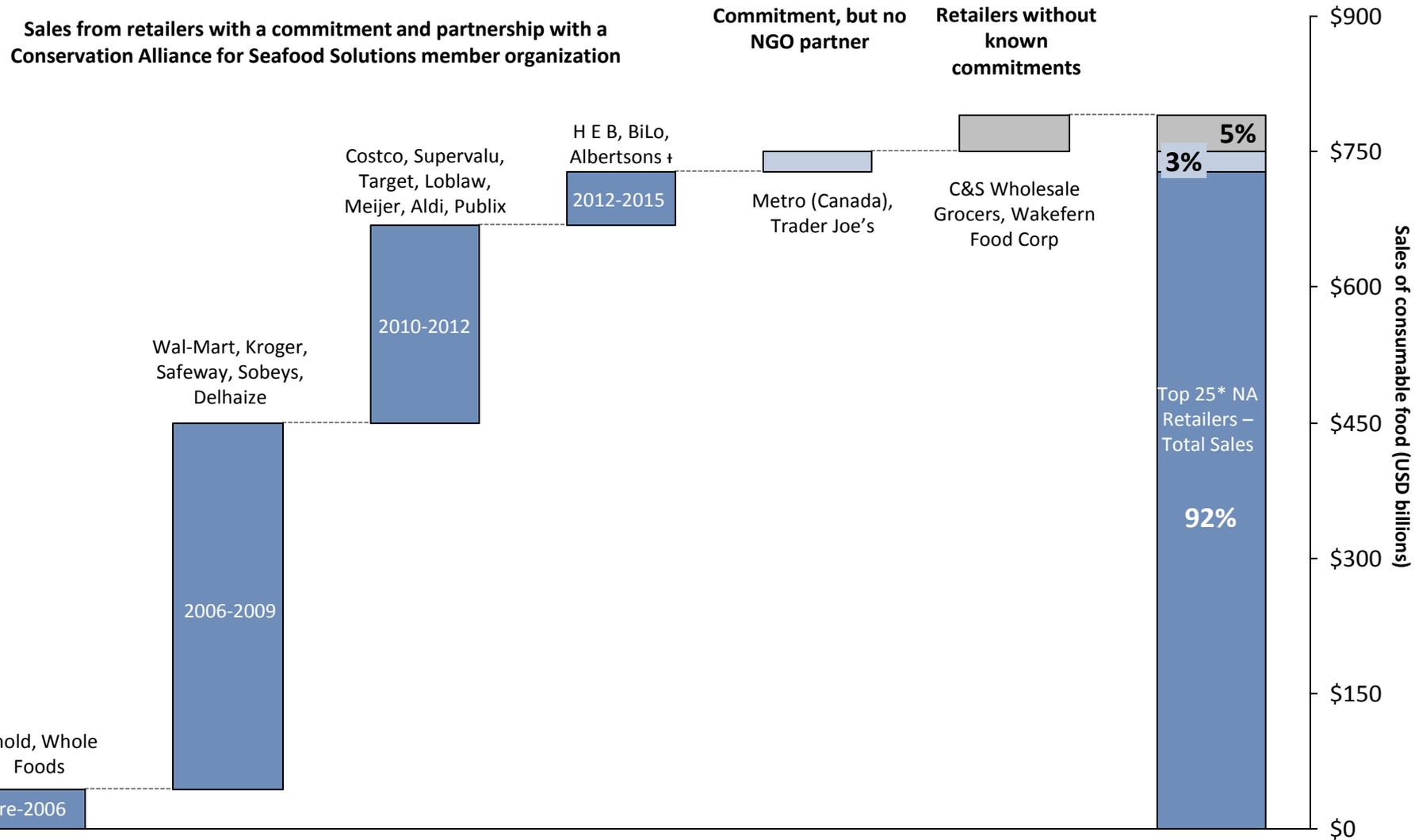
Retailers in the U.S. and E.U. have made the most sustainable seafood commitments, though specialty seafood restaurants and contract caterers have also made commitments, as have a handful of distributors, fast food restaurants, pet food makers, and businesses involved in hospitality management. Many of these commitments take the form of sourcing certified (MSC, ASC, GAA, etc.) products or products from fisheries engaged in FIPs. Others center around traceability and chain of custody. Still others focus on partnerships with NGOs and NGO programs that work across multiple aspects of sustainability, such as those run by members of the Conservation Alliance for Seafood Solutions (the Alliance*). The following slides focus on commitments that a) involve an NGO partner and b) largely center on wild-caught seafood.



* Members with retail partnerships include SFP, WWF, MBA, FishWise, EDF, GMRI, NEAq, and SeaChoice, among others. Context and color provided by Dick Jones, Resiliensea.

BUSINESS RELATIONSHIPS

Top 25* North American retailers' commitments to sustainable seafood have leveled off, with over 90% of the market share engaged



† Will adopt Safeway's commitment as they complete their merger.

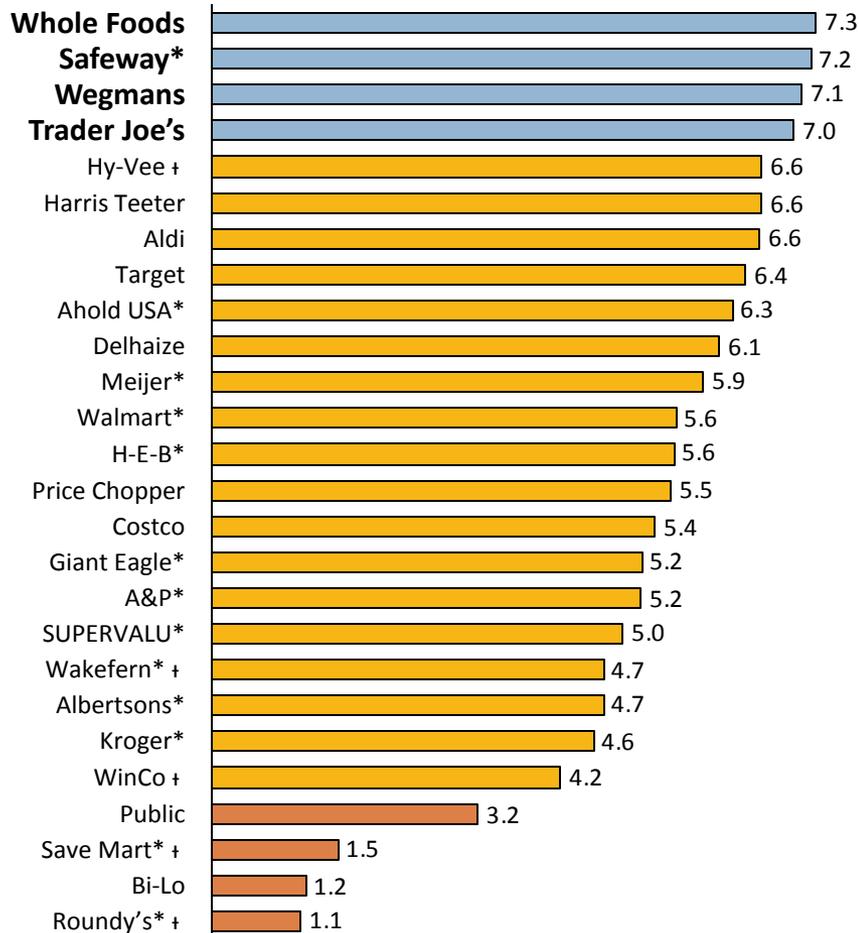
* 7-Eleven, CVS Health, Dollar General, and Walgreen Co were removed due to lack of seafood sales

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

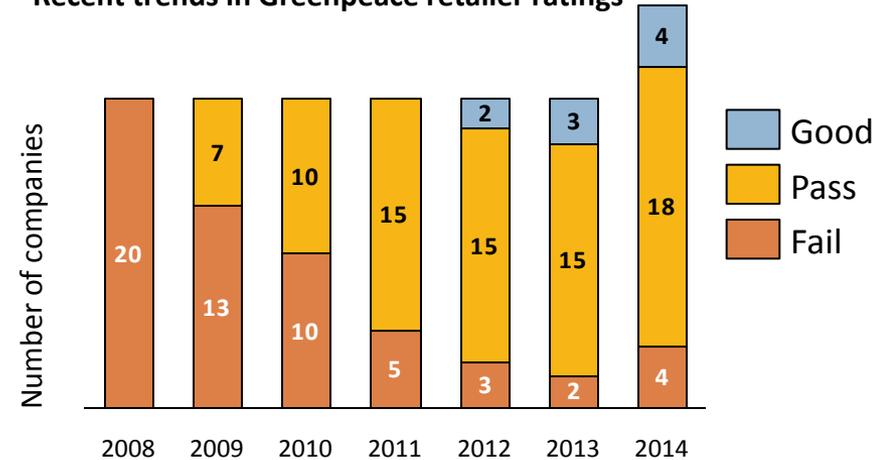
BUSINESS RELATIONSHIPS

Retailer sustainability scores assigned by Greenpeace have improved significantly year after year

2014 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.
- In 2012, for the first time, two retailers (Whole Foods and Safeway) received a "good" score from Greenpeace. Trader Joe's received a "good" score in 2013, as did Wegmans in 2014.

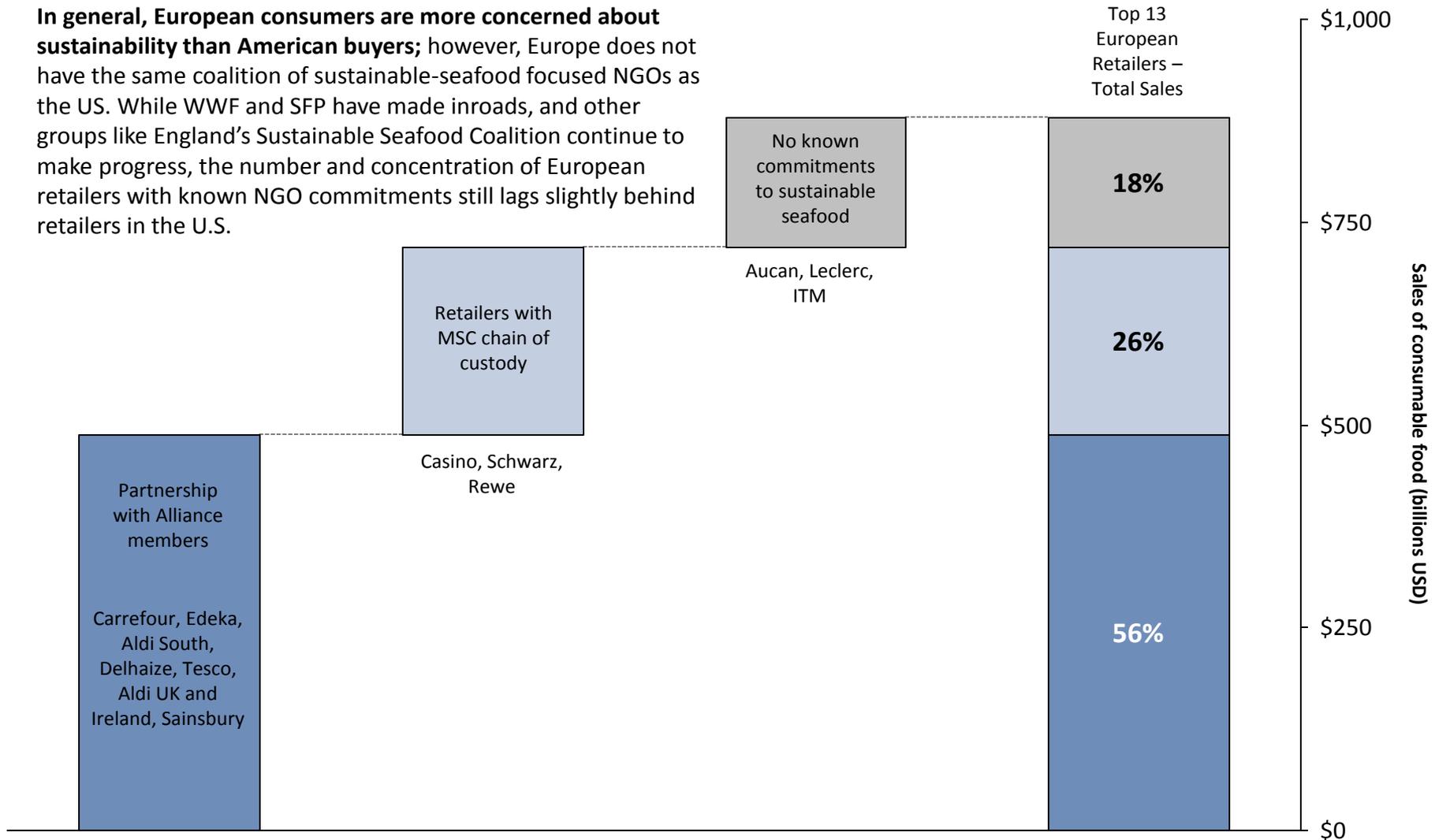
* Denotes parent company with multiple store banners.

† Not included in previous years' reports.

BUSINESS RELATIONSHIPS

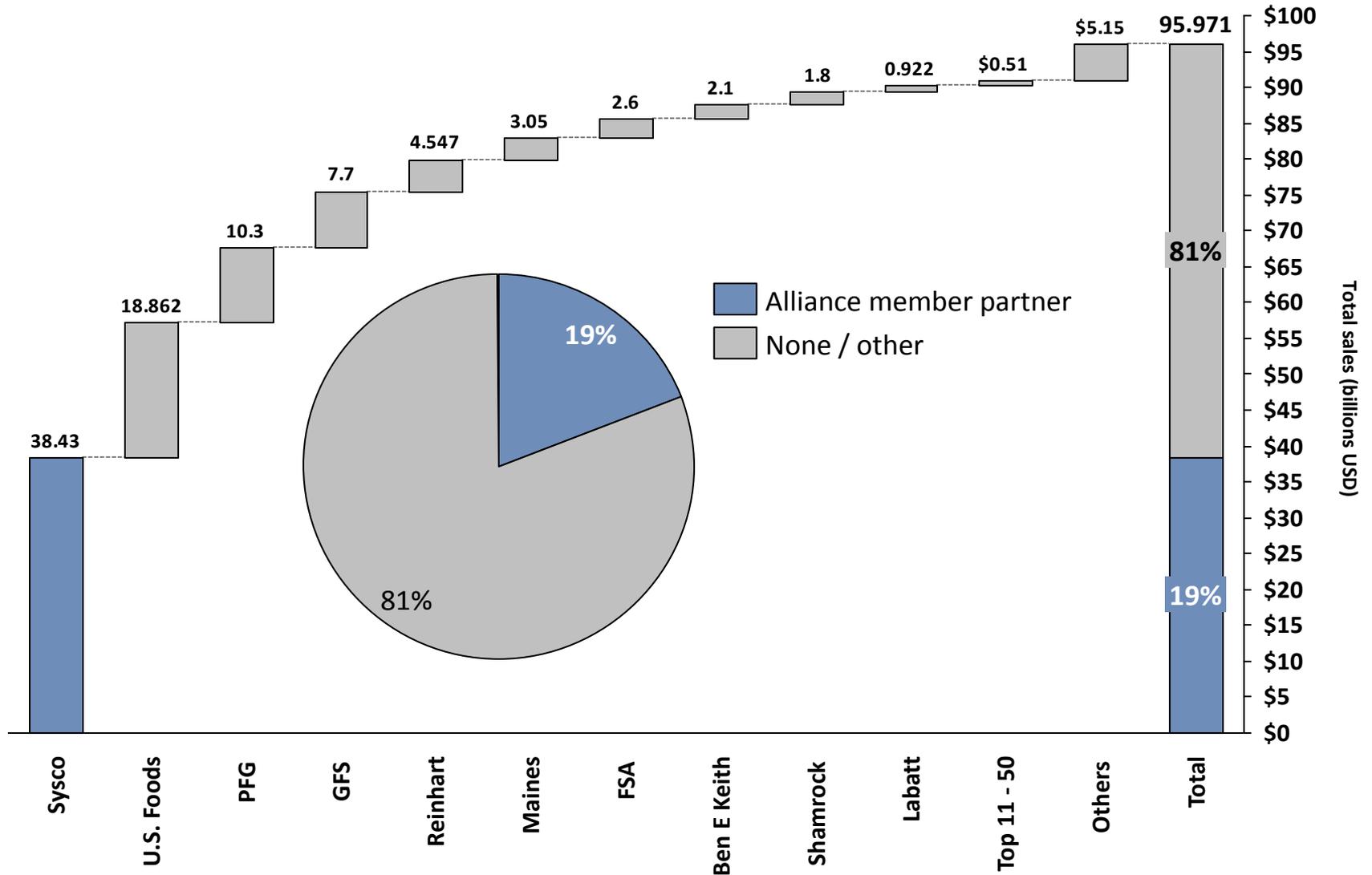
Of the top 13 European retailers, the majority have also made commitments to sustainable seafood

In general, European consumers are more concerned about sustainability than American buyers; however, Europe does not have the same coalition of sustainable-seafood focused NGOs as the US. While WWF and SFP have made inroads, and other groups like England’s Sustainable Seafood Coalition continue to make progress, the number and concentration of European retailers with known NGO commitments still lags slightly behind retailers in the U.S.



BUSINESS RELATIONSHIPS

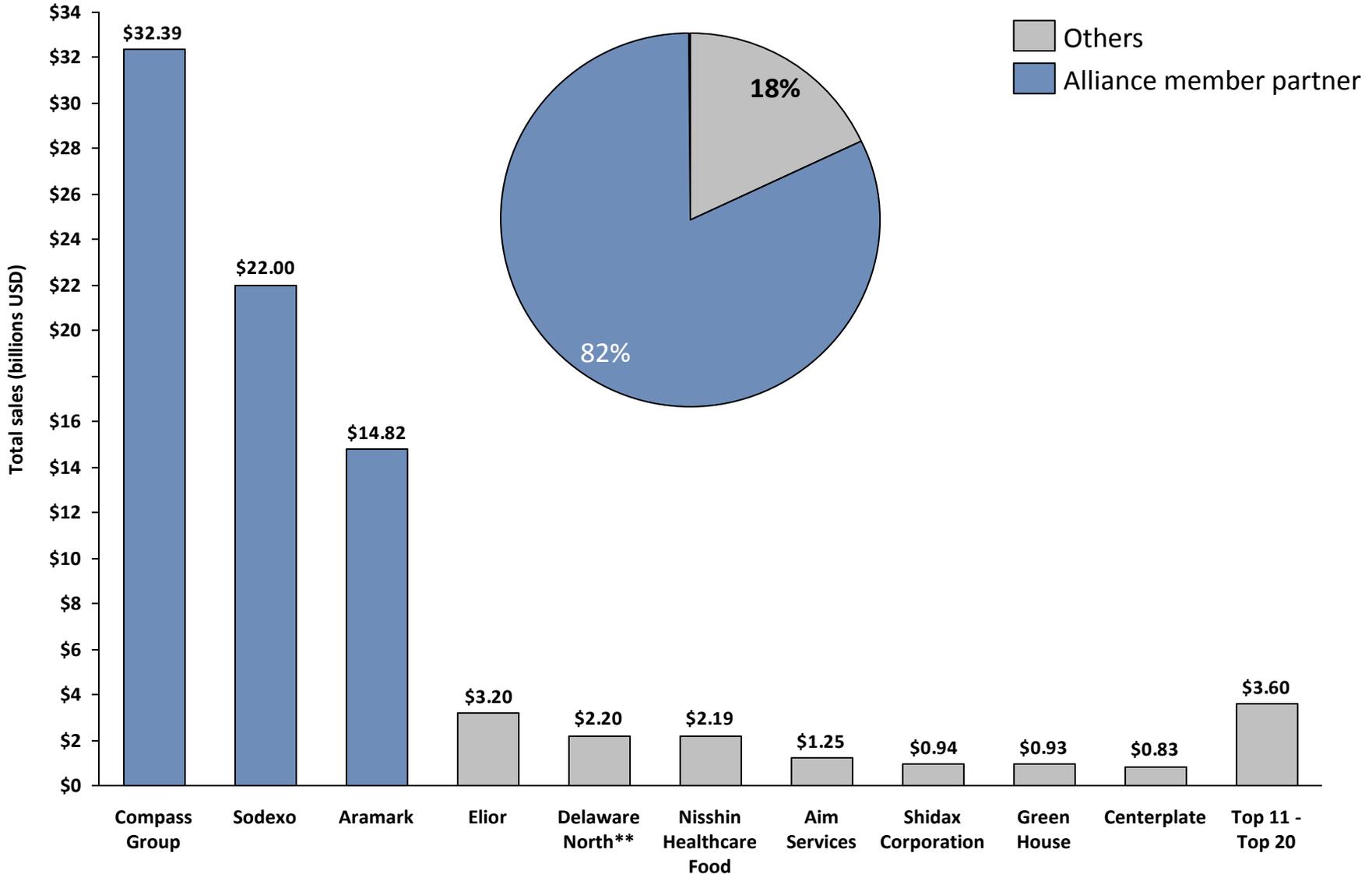
North American broadline foodservice is more fragmented. Apart from Sysco, there is little known engagement.



*Sales as of 2013

BUSINESS RELATIONSHIPS

Of the top 20 global contract catering companies, the three largest have commitments

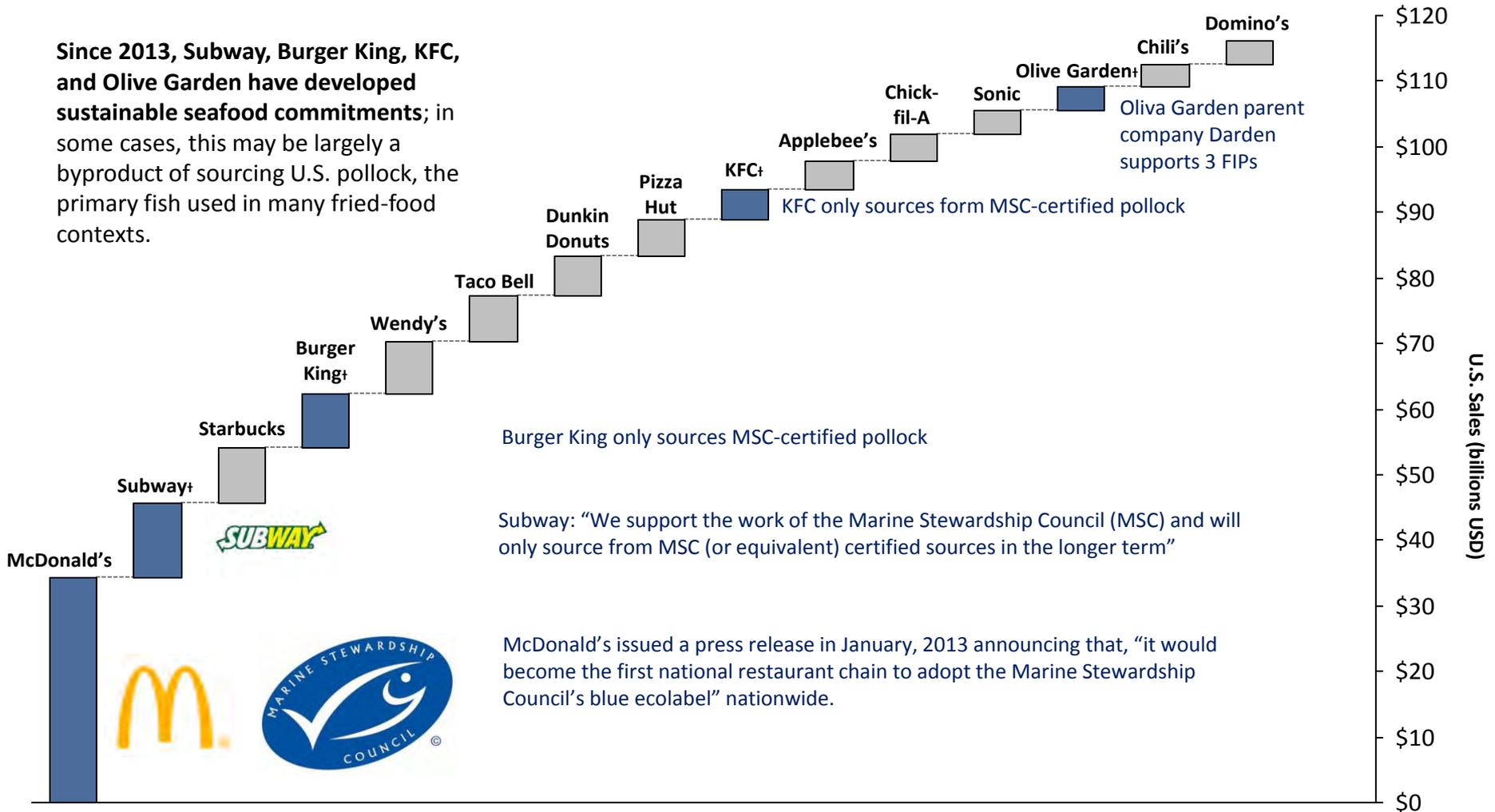


*Sales as of 2013; **Delaware North cites MBA's SFW program as helping guide its procurement decisions.

BUSINESS RELATIONSHIPS

Top-15 U.S. fast food restaurants by sales; an increasing number of restaurants source MSC-certified pollock

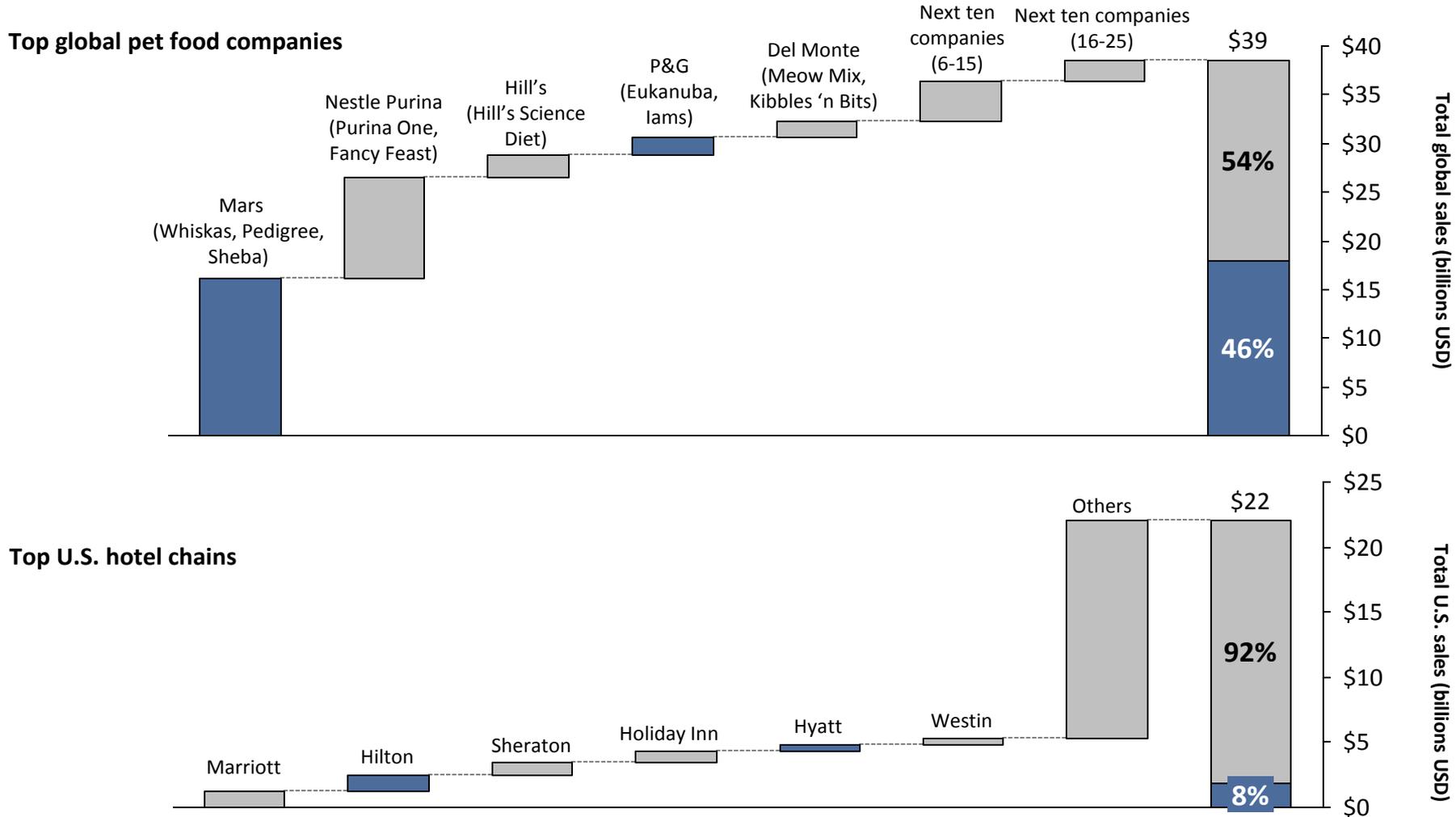
Since 2013, Subway, Burger King, KFC, and Olive Garden have developed sustainable seafood commitments; in some cases, this may be largely a byproduct of sourcing U.S. pollock, the primary fish used in many fried-food contexts.



† Commitment newly documented since 2013 report

BUSINESS RELATIONSHIPS

Among other major seafood buyers (pet food companies, hotel chains), only a handful have sustainable seafood commitments



Sea Pact Distributors are building sustainability into supply chains

Distributors sit in the middle of the supply chain, and while they generally aim to provide whatever the buyer wants, some are increasingly making commitments around sustainable seafood. One such example is Sea Pact, a group of North American seafood distributors that have all agreed to implement sustainability commitments. Working in partnership with FishWise, SFP, Resiliensea Group, and the New Venture Fund, members pool annual dues to fund project grants to improve sustainability up the supply chain, including FIPs, AIPs, gear improvements, research, and other projects.

Sea Pact members span a range of geographies



Vancouver



Chicago



Boston



Los Angeles



Toronto



Denver



Halifax



Baltimore



Boston

BUSINESS RELATIONSHIPS

Conservation Alliance for Seafood Solutions serves as a coalition of likeminded environmental NGOs promoting seafood sustainability

The Conservation Alliance for Seafood Solutions (the “Alliance”), a network for sustainable-seafood focused non-profits, has continued to grow both in absolute numbers and in effective projects and collaborations.

- The number of annual meeting participants roughly doubled between 2013 and 2015, to nearly 100.
- There are currently 239 Alliance members on Podio, which is used as online collaboration and information sharing platform for the Alliance; on average roughly a third of members log in each week.

The Alliance serves as a platform for collaboration across a range of issues

1. Key data elements	2. Working groups	3. FIP guidelines	4. Collaborative letters	5. MBA-driven work
At the request of seafood businesses, alliance NGOs have begun work to align around key data elements for source fisheries/ aquaculture products	Some alliance members coordinate to develop potential tools to advance consumer demand through a dedicated working group. Similarly, there are multiple species-specific working groups.	In March 2015, the Alliance updated its guidelines for fishery improvement projects to help provide clarity in a rapidly expanding landscape of FIPs. Work is underway on a FIP tracking website.	Alliance members have coordinated to submit joint input letters to organizations including: <ul style="list-style-type: none"> • Fair Trade • MSC • NOAA MAFAC proposal • ASEAN FIP protocol • Magnuson reauthorization 	The Alliance overlaps with multiple Monterey Bay Aquarium-driven initiatives, including a tuna working group, a survey of Alliance groups on business advice for seafood commodities, and a roundtable dialog with the food service industry.



Creating conditions for business change

Key takeaways

- Media coverage and user searches for sustainable seafood terms appear to have remained consistent over recent years.
- The limited available data suggests that coverage of sustainability issues in industry media and attendance at sustainable seafood events has stabilized.
- U.S. seafood consumption per capita is stable, although tastes have been changing: salmon, tilapia, and pangassius are becoming more popular.
- High-quality time series data on consumer attitudes are sparse, but the available data suggest that “sustainability” is important for a committed subset of consumers and is a factor for more than half of all consumers.
- Traceability continues to improve as initiatives proliferate and mature.

CHAIN ENGAGEMENT

Influential businesses operationalize their commitments to sustainable seafood

government regulations and enforcement

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.

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Greenpeace's scorecard data

Media and literature penetration

Industry event attendance

U.S. seafood consumption

Consumer interest and preferences

Enabling businesses and initiatives

Timeline

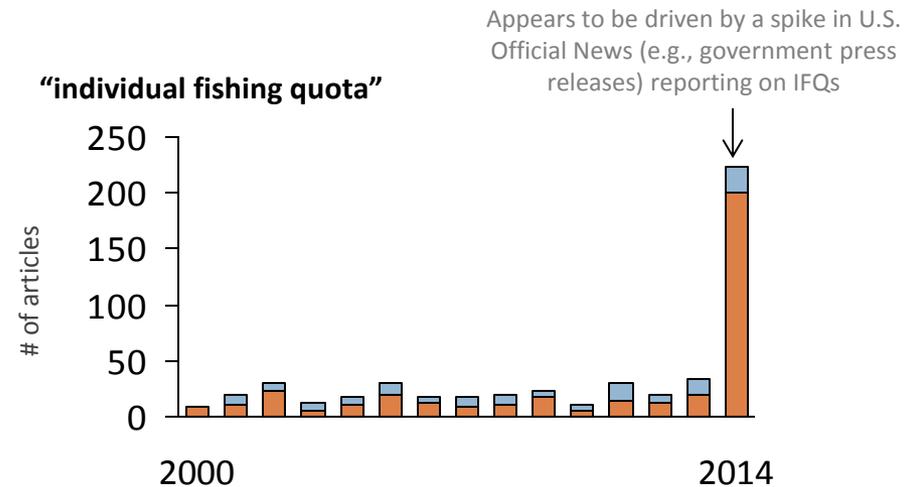
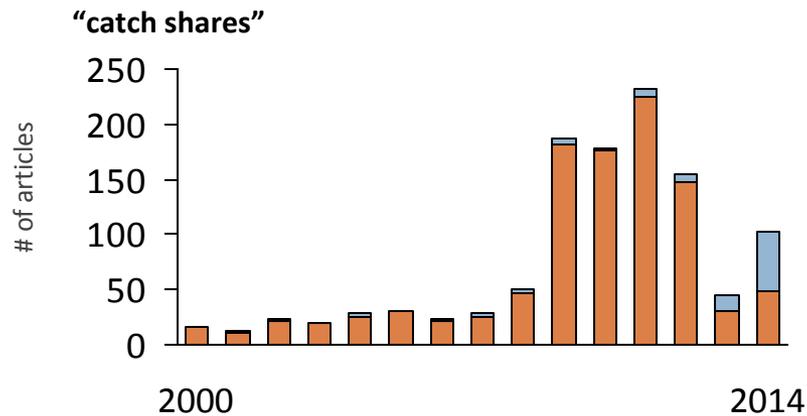
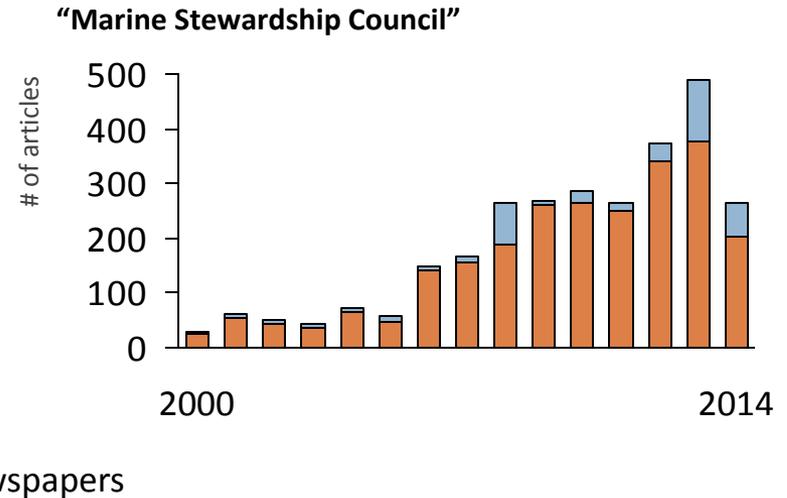
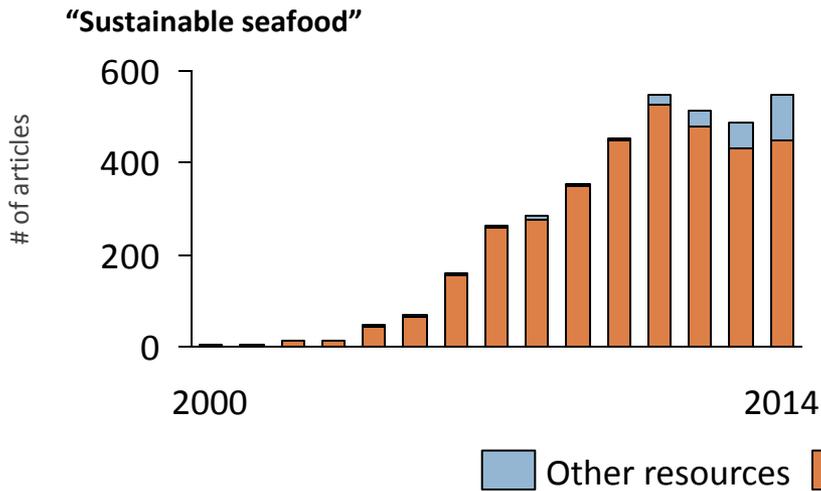
Policy update

Policy update

State Measures

CREATING CONDITIONS FOR BUSINESS CHANGE: MEDIA

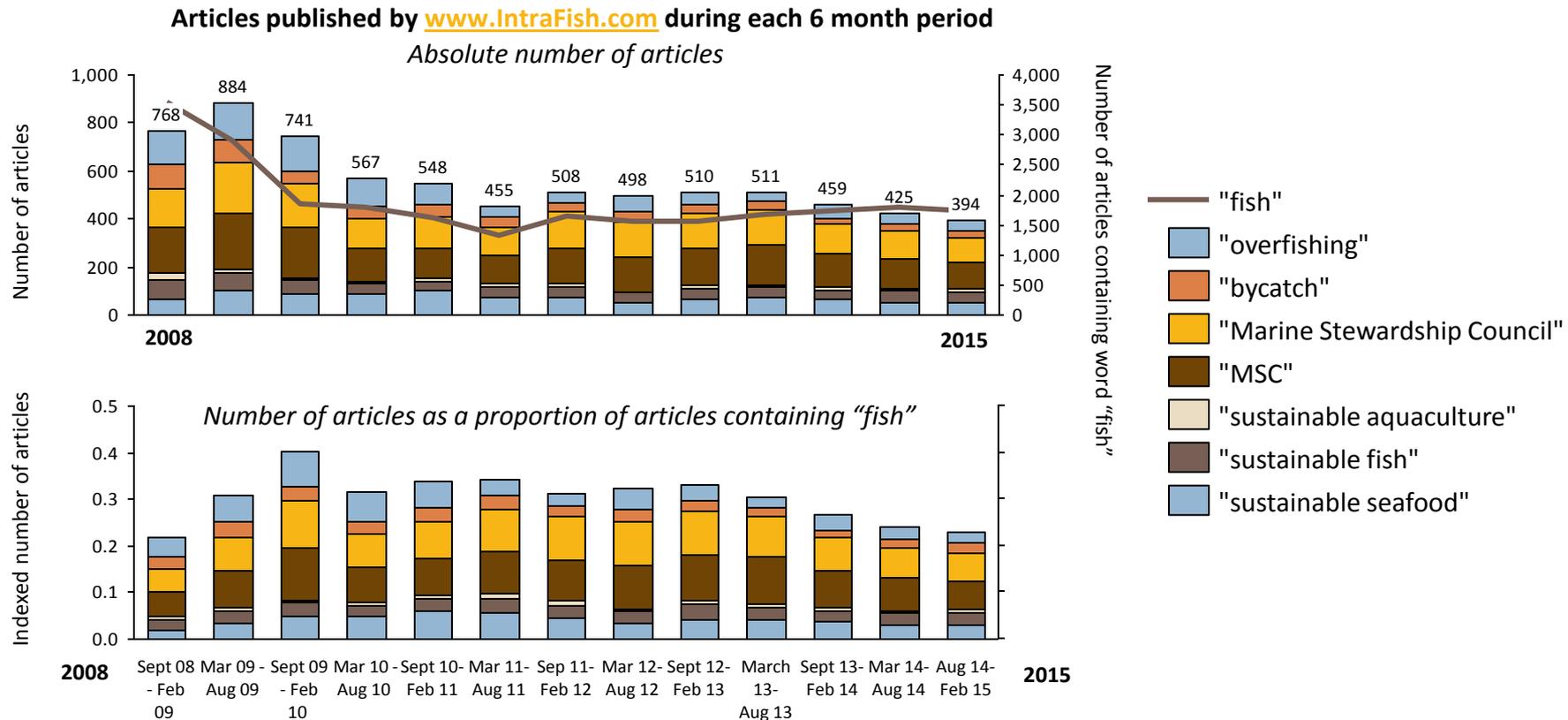
General media coverage of sustainable seafood has stabilized or generally increased over the past 15 years



Note: not controlled for number of articles in the database each year.

Dialogue about sustainable seafood on Intrafish.com (a seafood industry website) has fallen slightly

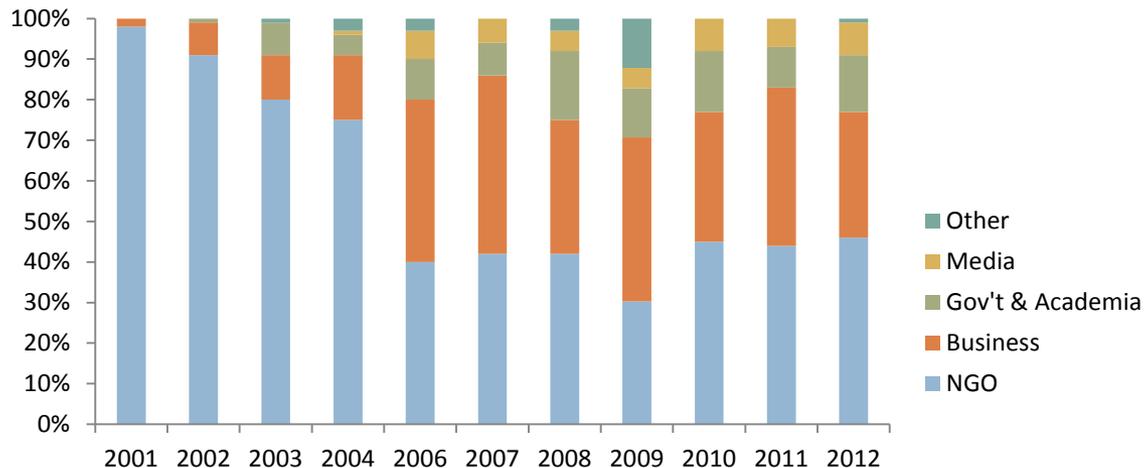
The number of articles on Intrafish.com that mention terms relating to sustainable seafood has declined slightly, however this probably reflects a broader decrease in the number of words/articles published: the number of articles mentioning terms related to sustainable seafood was cut in half between 2008 and 2015, just as the number of articles containing the word “fish” fell by a similar amount. The indexed number of articles (see below) does indicate that the relative portion of articles referencing sustainability has decreased since 2012.



Seafood Summit attendance and composition have stabilized and matured

Seafood Summit attendance suggests a potential maturation of the sustainable seafood movement. After growing enormously from its inception in 2001 to a high of 700 people in 2011, SeaWeb decided to cap summit attendance at 500 in recent years. The hope is that the smaller summit can serve as a means to foster connections among a considered, engaged group of leaders, while other fora (e.g., the Boston Seafood Show) can offer a wider tent. The composition is mostly stable, with 30-40% of attendees coming from business.

Seafood Summit attendees, by sector

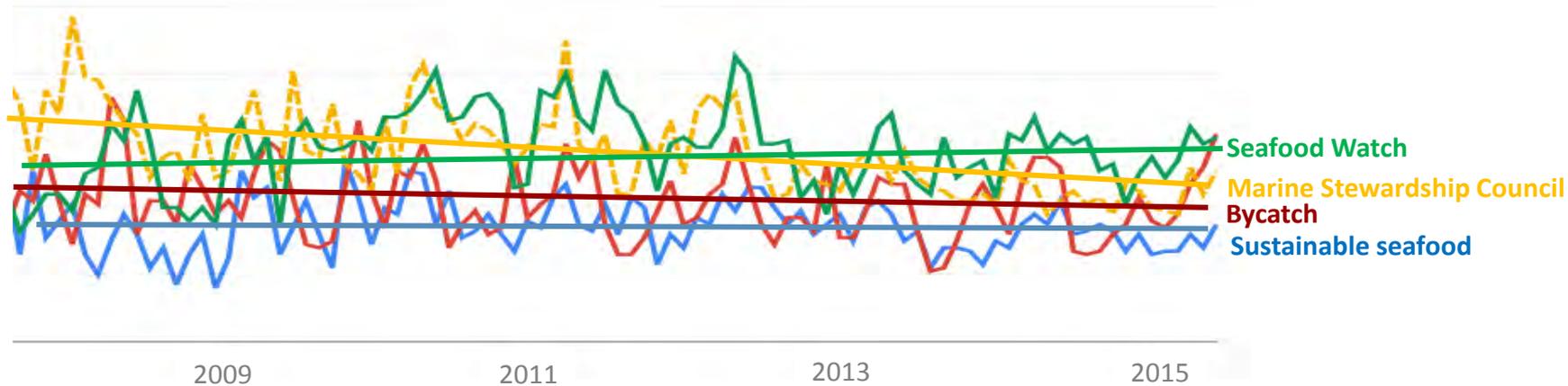


- Non-U.S. participants made up 70% of all attendees in 2012, an all-time high. This was likely a function of the summit being held in Hong Kong for the first time.
- NGO participation is stable, comprising around 45% of attendees.
- Anecdotal evidence suggests that the Summit is attracting an increasing number of high-level attendees, such as buyers that control purchasing decisions.

Consumer searches around sustainable seafood issues are generally stable

Google Trends, which measures the relative (not absolute) volume of search traffic, suggests that search interest in sustainable seafood issues is stable.

Google Trends for searches related to key words related to sustainable seafood

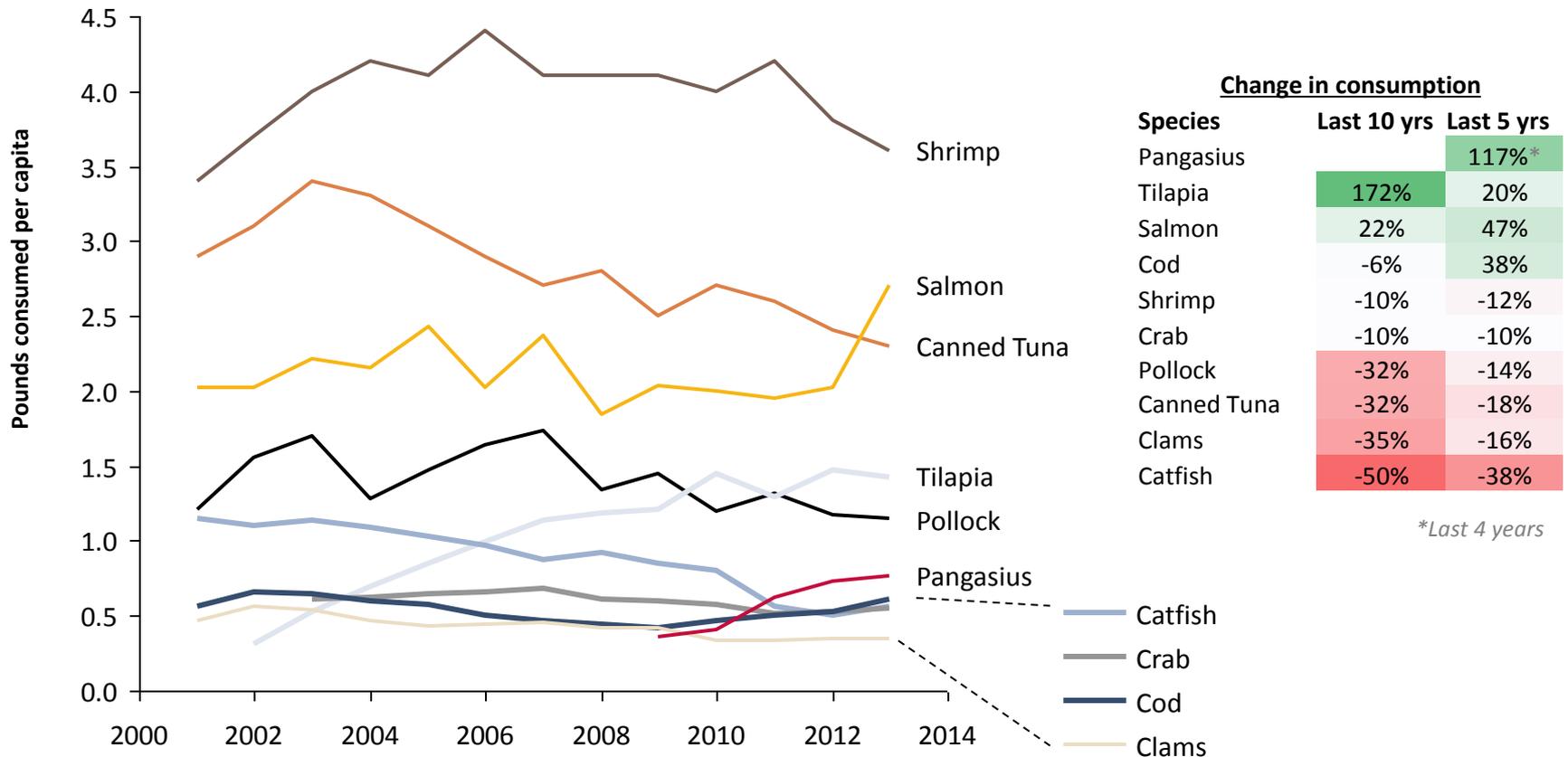


One difficulty with measuring both consumer interest in sustainable seafood and media coverage of seafood issues is adjusting for the total number of searches or articles published. As content in general proliferates, more words are published overall. Google Trends avoids this problem by measuring searches relative to overall search volume.

CREATING CONDITIONS FOR BUSINESS CHANGE: CONSUMERS

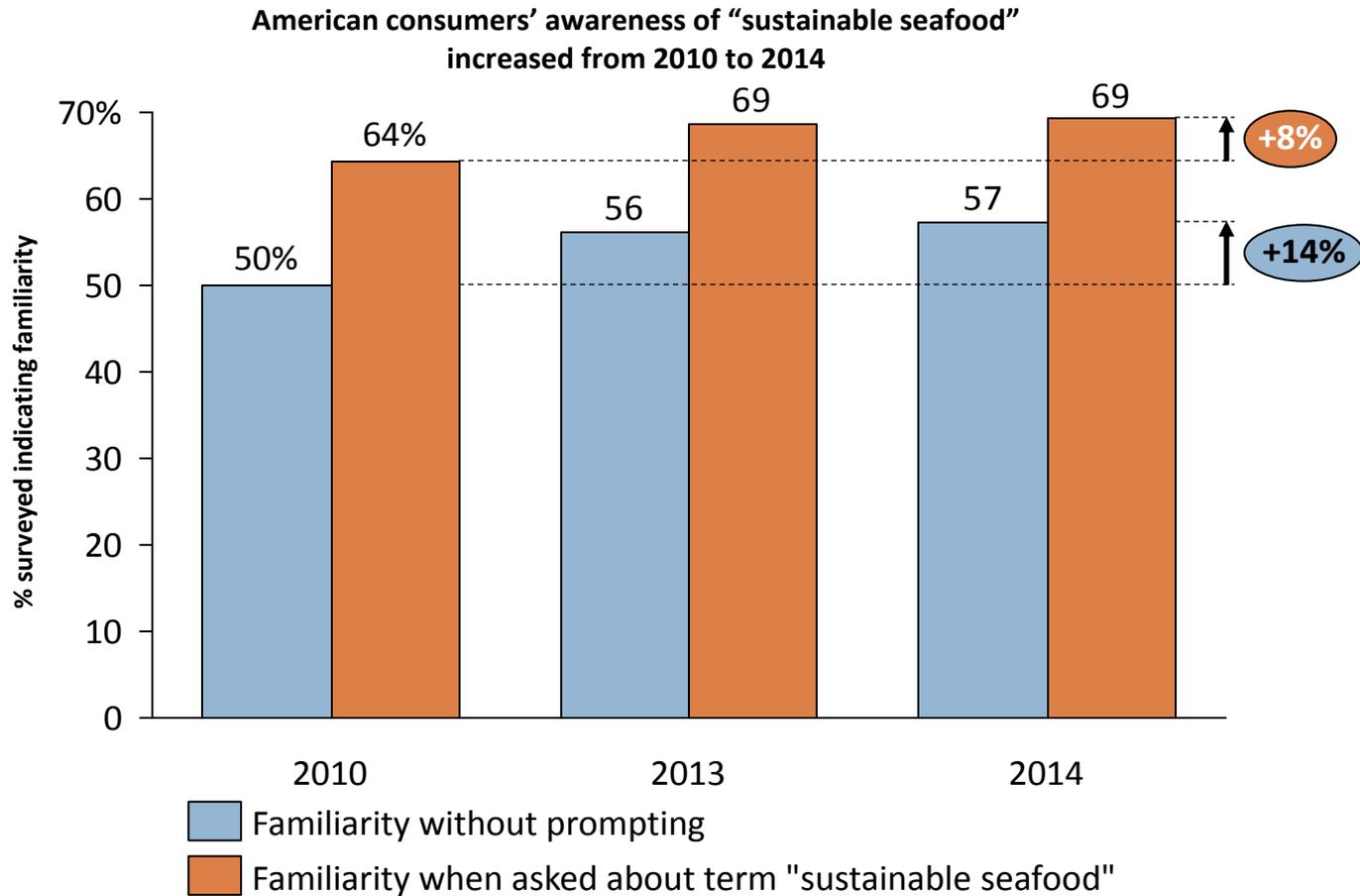
Shrimp, salmon, and canned tuna remain Americans' preferred seafood choices. The consumption of farm-raised whitefish is growing quickly.

Over the past few years, the average American has consumed more salmon, pangasius, and tilapia (all species groups with major farmed production), but has slowly decreased consumption of shrimp, canned tuna and catfish. Other fisheries products exhibit stable or up-and-down trends in consumption.



Consumers are increasingly aware of the concept of sustainable seafood

Over the past few years, the number of consumers indicating awareness of sustainable seafood in the U.S. has risen by 8-14%, depending on the question being asked. More than two thirds of Americans are familiar with the term “sustainable seafood” when prompted.

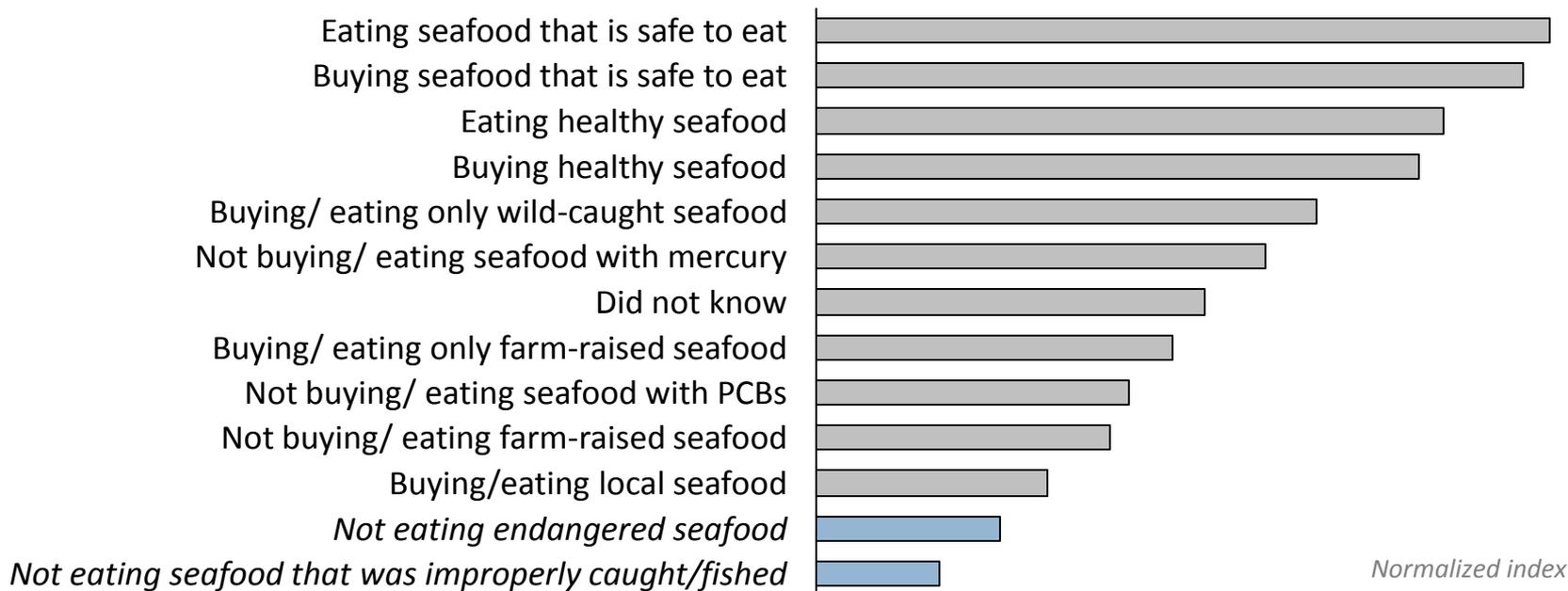


For consumers, “sustainable seafood” means “safe to eat”

Environmental concerns ride on the coattails of health concerns where “sustainability” is concerned.

Consumers tend to perceive organic and sustainable items as healthy and, secondarily, as providing environmental co-benefits. This is particularly true for consumer perceptions of sustainable seafood, in which health concerns took precedence and purely environmental concerns (italicized, below) were the issues least associated with the term.

Consumers describe “sustainable seafood” as:



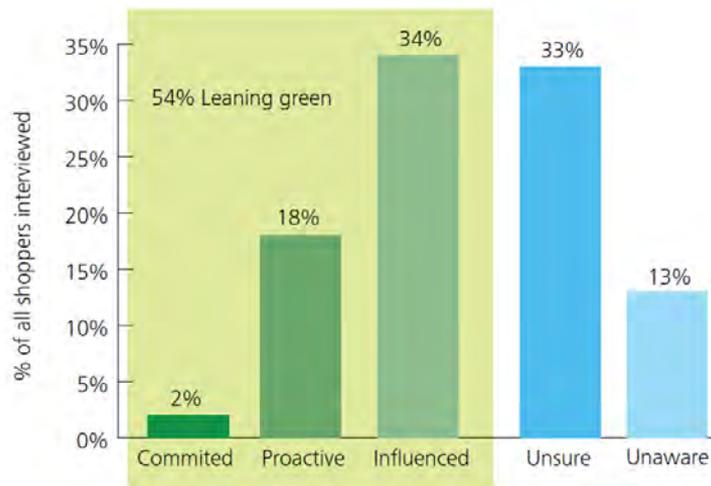
Normalized index

CREATING CONDITIONS FOR BUSINESS CHANGE: CONSUMERS

One study hypothesizes that environmental issues are a “tiebreaker” for consumers when other, more important decision-making criteria are equal

About half of shoppers say they actually consider sustainability when making shopping decisions. A small number strongly favor green products, but most shoppers tend to consider sustainability characteristics as one of many factors or as a tiebreaker when other factors are relatively equal. Thus, sustainability can lead to product switching.

Breakdown of shoppers by green purchasing attitude (2009)



- **Committed** shoppers make purchasing decisions based on sustainability wherever possible
- **Proactive** shoppers integrate sustainability considerations into their buying decisions
- **Influenced** shoppers see sustainability as secondary, and use sustainability as a tiebreaker
- **Unsure** shoppers were neutral to sustainability
- **Unaware** shoppers, some of whom rejected sustainability, may avoid green products

*Note that, in many shoppers, these attitudes vary by context and over time.

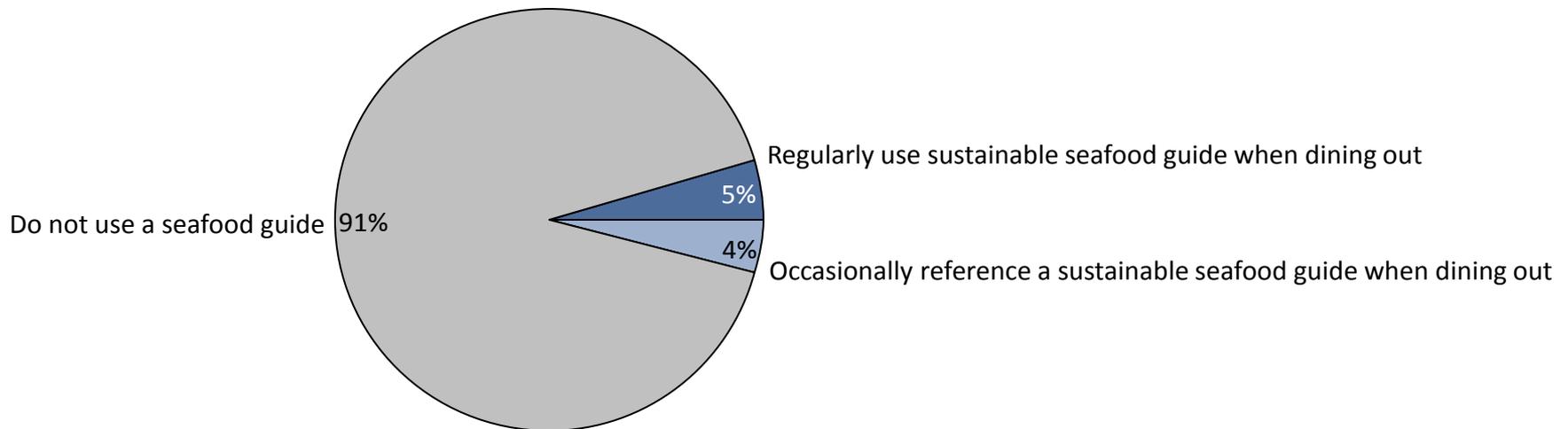
CREATING CONDITIONS FOR BUSINESS CHANGE: CONSUMERS

A small group of consumers regularly make purchasing decisions based on sustainable seafood guides

A small proportion of U.S. households take steps to purchase sustainable seafood.

- **More than half** of U.S. consumers are familiar with the concept of sustainable seafood.
- **2%** of the consumer market regularly referenced a sustainable seafood guide like the MBA Seafood Watch guide when shopping for seafood and **4.5%** regularly referenced a sustainable seafood guide when dining out (smart phone applications are increasingly preferred over cards for regular users). However, staff and chef recommendations are sometimes considered more convenient, accessible, and trustworthy than general guidelines.

U.S. consumer market use of sustainable seafood guide when dining out

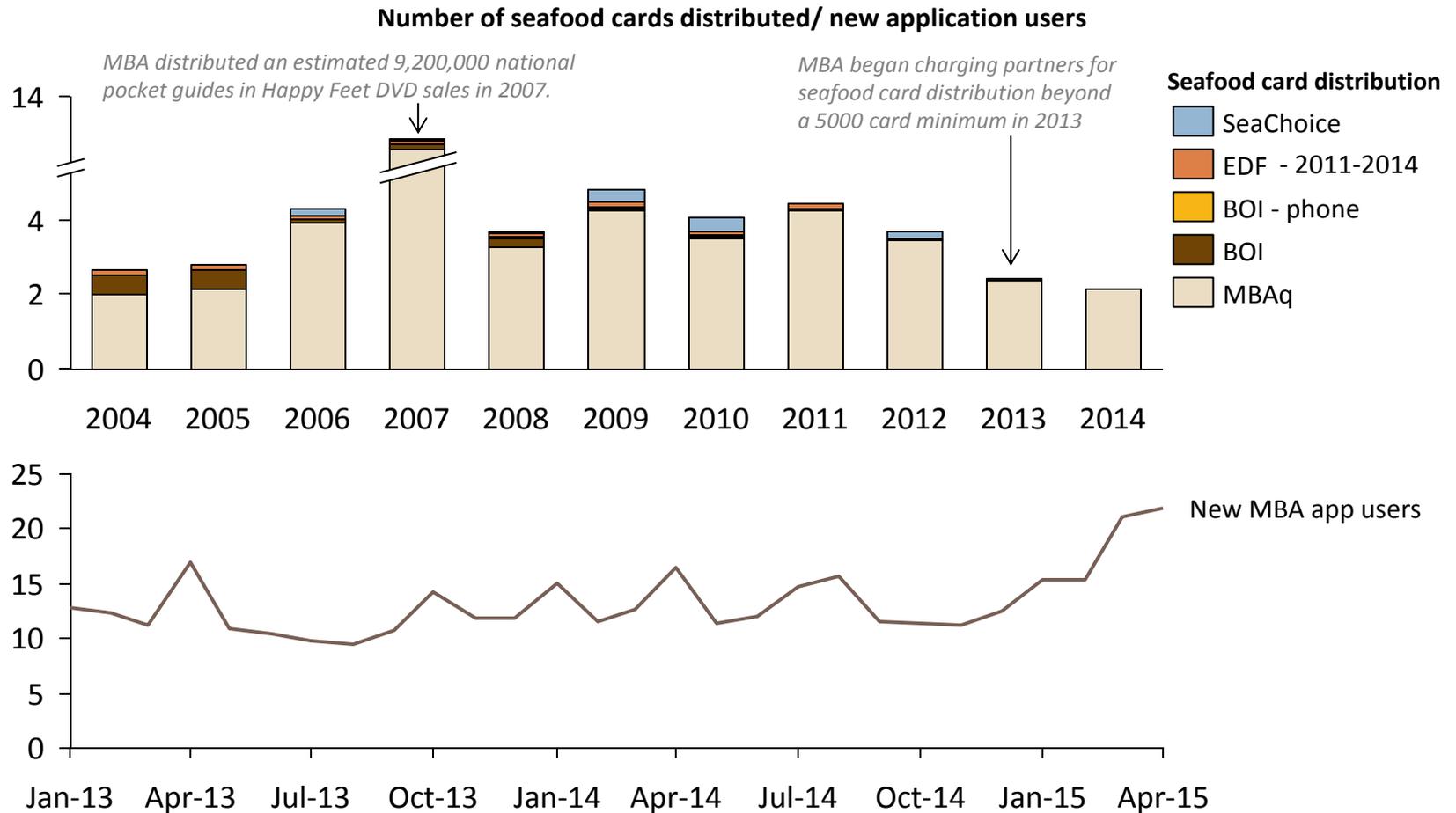


Updated slide (8/18/15): a previous version of this slide showed 40% proportion of U.S. households as having used a sustainable seafood guide. In fact, this statistics only applies to the subset of survey respondents *indicating awareness of a sustainable seafood program*. The slide has been updated accordingly to avoid future confusion.

CREATING CONDITIONS FOR BUSINESS CHANGE: CONSUMERS

Seafood card distribution has waned in recent years; consumers may instead use phone applications as a resource

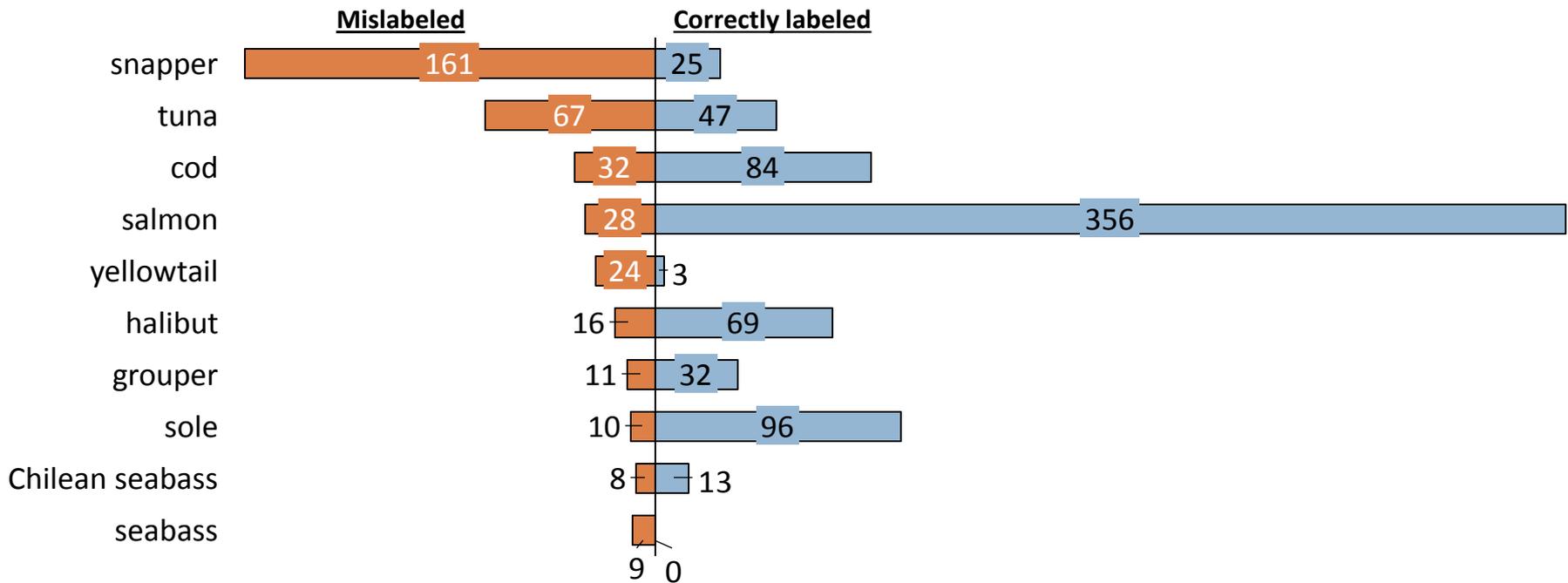
Monterey Bay Aquarium is the primary source of North American seafood cards. EDF and Blue Ocean Institute (BOI) ceased seafood card printing and distribution in 2012. Smart phone application use is on the rise, with in excess of 35,000 new users accessing the Seafood Watch application in April 2015.



Consumers are increasingly cognizant of the risk of fish mislabeling

A 2013 Oceana study found widespread mislabeling in the U.S. Snapper and tuna were the most commonly mislabeled species. Sushi restaurants were found to have the worst level of mislabeling, with 74% of restaurants having some mislabeling. Mislabeling was common across a range of geographies, with rates highest (over 50%) in Southern California. This study was widely reported on and has led to nascent policy changes to improve labeling and traceability.

Mislabeled Among Most Commonly Sampled Fish Types



Traceability initiatives are proliferating

In addition to trade policy and import controls in the U.S. and the E.U. (see Policy section), there have also been notable developments in the technology used to monitor fisheries and trace fish through the supply chain.

Fishery Monitoring Initiatives



Global Fishing Watch is a technology platform that uses AIS/satellite data to visualize global fishing activity. Developed through a partnership between Oceana, Google, and SkyTruth, Global Fishing Watch is a publically available, user-friendly website that tracks global fishing activity. A prototype has been released and a public version is in development.



Project Eyes on the Sea is a collaboration between Satellite Applications Catapult (SAC) and Pew. Pew and SAC work directly with governments that are interested in reducing IUU fishing in their waters. They combine satellite monitoring and imagery data with fishing vessel databases—that rely on Unique Vehicle Identification numbers as well as AIS and VMS—to detect illegal fishing.

Supply Chain Traceability Technologies



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

- In 2012, the US-based grocery chain, Price Chopper, became the first supermarket to voluntarily conduct DNA testing on its seafood in order to assure customers of the accuracy of Price Chopper's seafood labeling.
- Darden, operator of Red Lobster, hires outside companies to do DNA testing make sure fish match supplier descriptions.

Inventory tracking systems continue to proliferate. The development of standards (e.g., GS1) that improve interoperability of inventory tracking systems, alongside technological advancements, are making these systems more affordable and effective.

- Bar code labeling of seafood allows for more accurate supply chain and inventory management. For example, U.S. import/distribution company Norpac has a bar code tagging system for individual fish, which allows managers to trace exactly where the fish comes from, when it was unloaded, species, and weight. Their system works in conjunction with vessel monitoring system (VMS) tracking of each fishing boat.
- RFID labeling utilizes small electronic tags that can be attached to seafood shipments to store information about origin, species, and other critical characteristics. As a top-100 supplier of Walmart, Beaver Street Fisheries was required to start employing RFID systems nearly a decade ago.



Traceability initiatives are proliferating

In addition to trade policy and import controls in the U.S. and the E.U. (see Policy section), there are other several other efforts in the traceability space worth noting:

Voluntary Market and Supply Chain Efforts



Certification schemes like those administered by the Marine Stewardship Council (MSC) and the Aquaculture Stewardship Council (ASC) now have chain of custody protocols in place to help trace fish back to their source.



The International Seafood Sustainability Foundation (ISSF) requires its members to source seafood from vessels that have 100% observer coverage, participate in a global vessel monitoring system, and have an IMO number. ISSF members represent over 75% of the canned tuna industry.



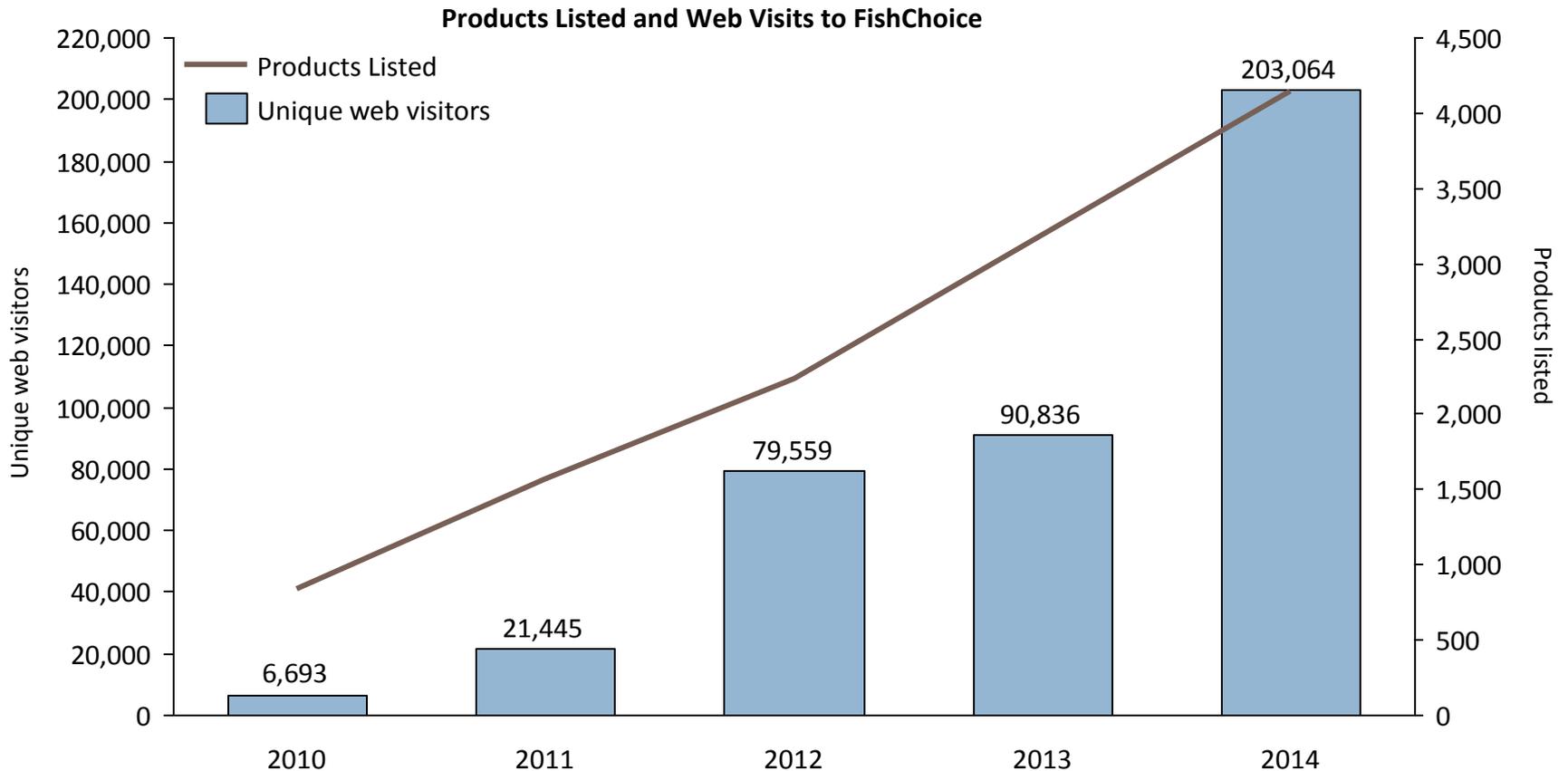
North American and European retailers are partnering with NGOs and adopting sustainable procurement practices and increased transparency around sourcing. Corporate efforts to improve traceability seem to be growing, driven in part by continuing reports of slave labor and other human rights violations within supply chains.



The Global Food Traceability Center, a U.S. public-private partnership with sponsors from industry, academia, and the conservation community, has been coordinating efforts to ensure alignment and interoperability of global seafood traceability systems and U.S. regulations.

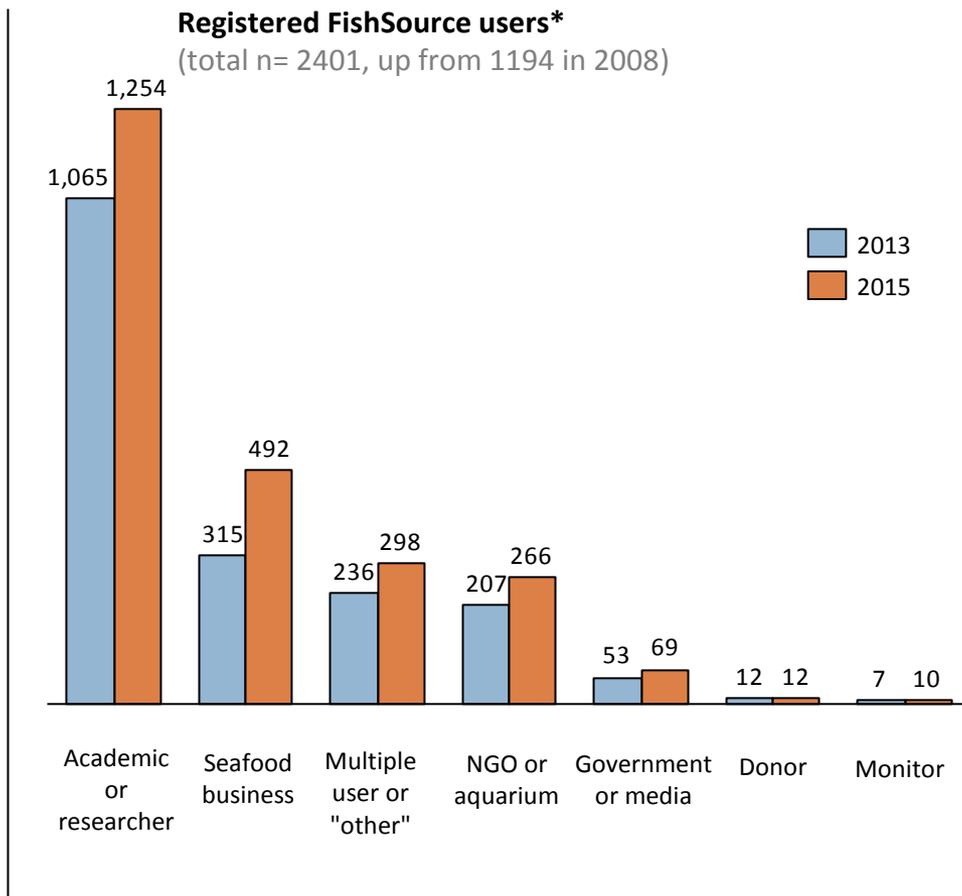
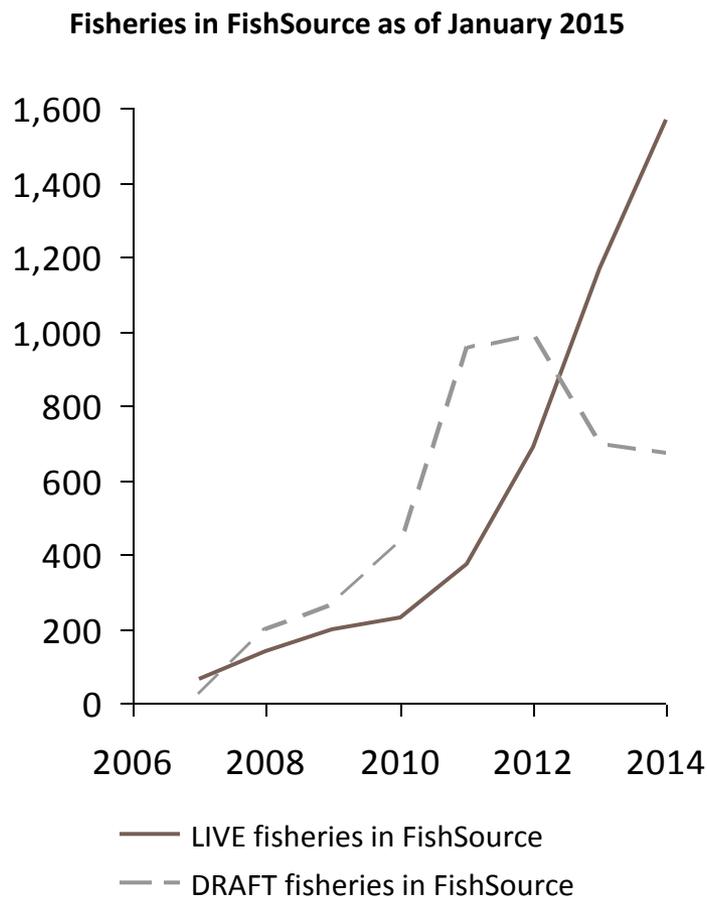
FishChoice continues to see a rapid growth in registered users and products listed

FishChoice aims to serve as a directory of sustainable seafood species, making it easier for retailers, restaurants, brokers, and other to find, procure, and sell these products. The number of users, listed products, and newsletter recipients continue to grow rapidly.



FishSource, a database monitoring the status and environmental performance of fisheries, continues to grow its user-base and fishery coverage

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.



*Registered users may or may not have accessed the site recently.
Source: Personal communications with Pedro Sousa, SFP

Policy change

METRICS INCLUDED

Global status and trends in fishery health and exploitation

Fishery In

Sea
Key commo

Corpor
Green

U.S. seafood consumption

Media and literature penetration

Seafood card distribution

Consumer survey data

Industry event attendance

GOAL: IMPACT ON THE WATER

Key takeaways

- The landscape of fisheries policy varies significantly by place, but there have been notable advances in a variety of countries in the last few years.
- IUU has also been a major theme on the international stage. The European Commission’s IUU card system has reportedly led to some significant changes in how supplying countries approach fisheries management. The U.S. is in the process of developing its own trade-related IUU regulations, which have the potential to bolster this trend.
- The Port State Measures Agreement requires ratification by an additional 14 nations before it comes into effect.

POLICY CHANGE

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

Policy timeline
E.U. policy update
U.S. policy update
Port State Measures

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.

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	Mexico: Progressive fishery law passed; allows for the establishment of government-administered fishery refugia Indonesia: Law passed allowing local governments to establish, manage, 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	Indonesia: 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	Europe: E.U. IUU legislation enters into force requiring all seafood imports 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	Australia: Puts ~1/3 of coastal waters into world's largest network of marine preserves Chile: New fisheries law requires ITQs and other key fishery management actions
2013		Europe: European Parliament voted for reform of the Common Fisheries Policy that includes requirements to manage MSY and discard bans International: CITES approved international trade restrictions for five species of threatened and endangered sharks
2014	Obama expands the Pacific Remote Islands National Marine Monument, creating the world's largest protected marine reserve A U.S. Presidential Task Force is established to recommend a comprehensive framework of programs to combat IUU fishing	Europe: 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 South Korea: Updates deep water fishing laws and improves enforcement
2015	U.S. Presidential Task Force on IUU released recommendations in December 2014, followed by an action plan in March 2015	Mexico: Fishery and MPA enforcement strengthened, turned over to Navy

Traceability initiatives in Europe and the U.S. are shifting the global landscape

The E.U., one of the world's largest seafood markets, currently has the most aggressive anti-IUU trade regulations. The requirements have the potential to significantly affect the drivers behind illegal fishing.

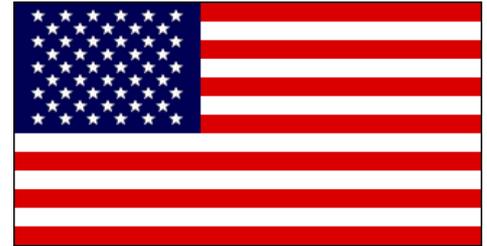
- Entering into force in 2010, the regulation requires all fishery imports be accompanied by a catch certificate with information about the species, catch location, fishing vessel, date of capture, and any trans-shipments that have taken place. In cases where a product is suspected as IUU, the E.U. Member States can refuse to import the fish.
- Countries that don't meet minimum requirements for combating IUU fishing can be yellow carded. If issues are not resolved after probation, a red card – or trade sanction – can be issued.
 - Yellow carded countries include: Belize, Cambodia, Fiji, Guinea, Panama, Sri Lanka, Togo, Vanuatu, and Thailand
 - Red carded countries: Cambodia, Sri Lanka, Guinea, and Belize
- The threat of E.U. trade sanctions has had a powerful effect on several exporting countries. For example, in 2013, shortly after the E.U. issued South Korea a yellow card, previously unforeseen action was taken by multiple agencies in South Korea, including the Parliament, the Ministry of Foreign Affairs, and the President, to update its distant water fisheries laws and improve enforcement.



Traceability initiatives in Europe and the U.S. are shifting the global landscape

The U.S., the second largest seafood importer, is in the process of developing its own trade-related IUU regulations.

- In June 2014, the White House established a Presidential Task Force to recommend a comprehensive framework of programs to combat IUU fishing and seafood fraud in the U.S.
- The Task Force released recommendations in December 2014, followed by an action plan in March 2015. The action plan includes measures to expand domestic partnerships to detect IUU fish, strengthen enforcement, and develop a traceability program to track seafood from harvest to entry into the U.S. The Task Force's action plan also outlines how the U.S. will work internationally to address IUU fishing, including through the Trans-Pacific Partnership (TPP) currently being negotiated with 11 other countries.
- The Presidential Task Force's key next steps are:
 - By October 2015, define the information that will be required for seafood products to enter the U.S., and identify which species this system will first apply to (based on the risk of being illegal).
 - By September 2016, finalize rulemaking to collect additional information on species at risk.
 - By December 2016, identify the steps needed to expand the program to all seafood entering the U.S., taking into careful consideration input from relevant stakeholders, as well as the experience from the first year of implementation.
 - Throughout the process, determine how information within the traceability system – including species, geographic origin, and means of production – can be shared with consumers.



PROGRESS ON POLICY CHANGE

The Port State Measures Agreement remains inactivated as only 13 of the needed 25 nations have ratified the agreement

The FAO Agreement on Port State Measures to Prevent, Deter, and Eliminate IUU Fishing, know as the Port State Measures Agreement (PSMA) has the potential to be a keystone international treaty against IUU.

- Signatories agree not to provide port access or services to foreign-flagged vessels known to have engaged in IUU fishing.
- PSMA would make 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 potentially punish bad actors.
- The Port State Measure was introduced by the United Nations Food and Agricultural Organization (FAO) in 2009. The treaty will come into effect once 25 states have signed; so far, 13 have, though an additional 16 have initiated the ratification process.

States that have ratified the PSMA (11 States)

