

Describing the diversity of community supported fishery programs in North America



Alexis E. Bolton ^{a,*}, Bradford A. Dubik ^{a,*}, Joshua S. Stoll ^b, Xavier Basurto ^a

^a Duke University Marine Laboratory, Nicholas School of the Environment, Duke University, United States

^b School of Marine Sciences, University of Maine, United States

ARTICLE INFO

Article history:

Received 2 September 2015

Received in revised form

6 January 2016

Accepted 6 January 2016

Keywords:

Community Supported Fishery (CSF)

Commercial fisheries

Sustainable food systems

Local seafood

North America

Traceability

ABSTRACT

This research investigates organizational diversity within Community Supported Fisheries (CSFs) in North America. Generally understood as the direct marketing of seafood through pre-arranged deliveries, CSFs have increased in number and geographic distribution since their origin in 2007. Despite, or because of, this rapid growth, fundamental questions remain unanswered about what organizational structures and business practices currently constitute the term 'CSF'. This research draws on interview data from 22 CSFs to highlight the diversity within the CSF movement and inform ongoing debates about appropriate paths for their continued growth. Interview data is used to describe key areas of convergence and divergence among the goals, business practices, and structures of CSFs. Three general types of CSF are identified based on this analysis: harvester focused, consumer focused and species focused. Each type is described through a short illustrative case study. Overall results indicate that the term 'CSF' does not currently refer to a specific structure or type of organization, but rather an approach to seafood marketing used by a variety of organizations with broadly similar production philosophies centered on engaging and informing consumers around traceable, domestically sourced seafood. Acknowledgment of CSFs as diverse and socially embedded organizations is necessary to understanding their potential benefits.

© 2016 Elsevier Ltd. All rights reserved.

1. Introduction

Community Supported Fisheries (CSFs) have emerged in recent years as a prominent trend in North American seafood distribution. Based on the Community Supported Agriculture (CSA) system, CSFs have been generally understood to involve the direct marketing of seafood from fishers to consumers through regular, pre-arranged deliveries of product [4,5,12]. CSF programs have rapidly increased in number and geographic distribution since they first emerged in 2007. Over the course of their existence, CSFs have also adopted new business practices, structures and goals that challenge accepted understanding of CSFs. This research draws on data from 22 CSFs in Canada and the United States to characterize the diversity that underlies the CSF movement and explore the implications of this diversity for understanding the social function of these nascent forms of organizing fisheries commercialization. In the findings, key areas of convergence and divergence among CSFs are highlighted, and three general types of

CSFs are identified, each type described through a short illustrative case study. The overarching goal is to bring clarity to the complex question of what CSFs are in practice.

Since CSF is a self-adopted label with no formal standardization to date, many arrangements vary in fundamental aspects of their philosophy and design. This variability is likely indicative of multiple factors, including the relative newness of the concept and the diverse social and ecological contexts in which CSFs are emerging. While such diversity is not necessarily surprising, and is perhaps an inevitable function of the evolution of these commercialization and marketing arrangements across the heterogeneous landscape of fisheries, it represents a source of mounting tension as the concept is attached to an ever wider range of marketing arrangements. In particular, this diversity has become a source of concern for some CSF owners, who have advocated for the development of criteria for CSFs, to ensure that certain production standards are met and that the designation continues to hold value and meaning with and among consumers. This tension sets the stage for the eventual enclosure of the concept – a path that is not uncommon in fisheries [22]. At stake is the trade-off between exclusion of certain models, approaches, or individuals, on the one hand, and on the other hand, the protection of certain underlying goals and values. As CSFs continue to find success and emerge in

* Correspondence to: Duke University Marine Lab, Nicholas School of the Environment, Duke University, 135 Duke Marine Lab Road, Beaufort, NC 28516, USA.

E-mail addresses: alexis.bolton@gmail.com (A.E. Bolton), bradford.dubik@duke.edu (B.A. Dubik).

¹ These authors indicate equal authorship.

new locations, debates about the trajectory of this movement take on greater importance. Understanding the current realities of CSFs is a fundamental first step for these processes to move forward constructively.

The implications of diversity also extend to academic and policy communities, where researchers have attempted to describe the broader social and environmental benefits that CSFs provide (e.g. [12,21]). While these works acknowledge diversity among CSFs, this diversity has not been characterized broadly in terms of specific organizational structures, goals, and business practices. This knowledge is necessary in continuing to explore the implications of CSFs for economic development and fisheries management, as well as for understanding questions related to their social function and impact on fishing communities.

This research does not attempt to directly define what CSFs should be, but rather treat them as local manifestations of a broader trend in seafood distribution and fisheries that are being shaped and reshaped by particular socio-environmental contexts. The dominance of globalized food production networks has spurred desire to reassert the importance of place in food system relationships for both socio-cultural and environmental reasons [5,8]. If CSFs are in part a political project in defense of a particular place or set of food production ethics, it should be expected that the structure of CSFs would vary somewhat based on the underlying qualities of the communities they emerge in. Such an approach allows for recognition that the definition of CSF is multiple and dynamic, being iteratively contested among CSF producers and negotiated with consumers. Describing diversity is a necessary first step in understanding how the CSF concept becomes localized through processes of adaptation and negotiation within a particular place. The goal of this approach is to inform industry members, consumers, researchers and managers as CSFs and the debates surrounding them continue to develop.

2. Methods

The analytical approach used for this study consisted of semi-structured interviews and participant observation. Interviews were designed to gather data on the origins, goals, challenges, sourcing practices, distribution methods, and seafood sales of CSFs, while participant observation was used to inform the development of three case studies that allow for an in-depth understanding of the main different types of CSFs identified within the sample.

2.1. Semi-structured interviews

A total of 22 semi-structured interviews were conducted with CSF programs for this research (Table 1; Fig. 1). All 39 CSF programs known to be operating in the United States and Canada

Table 1
CSF interviews by region.

West Coast		East Coast		Island and Inland States	
State	Interviewee	State	Interviewee	State	Interviewee
AK	Coordinator	MA	Owner	HI	Coordinator
AK	Coordinator	ME	Owner	IL	Coordinator
BC	Owner	NC	Owner		
CA	Owner	NC	Owner		
CA	Owner	NJ	Coordinator		
CA	Owner	NY	Owner		
CA	Owner	NY	Owner		
WA	Owner	NY	Owner		
OR	Coordinator	NY	Owner		
OR	Owner	SC	Owner		

were invited to participate, 34 of which were identified through the online network LocalCatch.org, and 5 of which were identified through researcher contacts and internet searches. Seventeen of the invited CSFs either did not respond, declined to participate in the research, or logistical difficulties prevented the interview from taking place. The names of CSFs have been removed for anonymity.

Author AEB conducted all interviews in a semi-structured format, allowing for the order of topics and interview questions to be adjusted to best fit the flow of conversation. The semi-structured interview guide combined a mix of open-ended questions and closed-ended survey-like questions following the style illustrated in Ref. [1]. Interviews were conducted remotely (either by phone or Skype software for voice calling) in January and February 2015. Interview participants included CSF operators, managers and coordinators. Most interviewees ($n=16$) were also the owner or founder of the organization, and some ($n=5$) were also the fisher for the CSF or the spouse of the fisher.

Interview results were thematically coded into response categories to facilitate analysis and comparison. Categories emerged inductively from the data, upon review of all interview responses. The categories are intended to capture the central topics in the response data and organize it in a way that allows for comparison of similarities and differences in the philosophy, structure and operations of CSF programs. Descriptive statistics are provided for the most relevant coded themes and direct quantitative responses. Most of the detailed interview results are found in the supplementary material (Appendix A).

2.2. Participant observation

Participant observation data is used as a way to contextualize interview responses and as input to develop the short case studies. Three of the authors have been engaged in ongoing CSF work, serving as advisors for a CSF for 1 year (AEB), 2 years (BAD) and 6 years (JSS), and engaging with the CSF movement more broadly since 2009. Additionally, JSS created and continues to maintain a national CSF network through LocalCatch.org. These experiences provide the authors with the opportunity to practice “observant participation” [3], both on how the CSF movement has developed, and on the emergence of individual CSFs, and incorporate these lessons into the description of the case studies.

3. Results and analysis

CSFs represent a diversity of arrangements and operations (see Table 2 for the summary results). To explore how that diversity shapes understanding of CSFs, and provide a baseline understanding of the core elements characterizing CSFs, the results in Table 2 are synthesized into areas of unification and divergence across the sample. Groupings CSFs into three types based on the central focus of their organizational and operational arrangement – harvester, consumer, or fish species, is then proposed. These subgroups are introduced not to create artificial divisions within CSFs, but to better describe and present the similarities among CSF organizations. When taken as a whole, the unifying characteristics of CSFs may seem limited, however when CSFs are separated into these subgroups, robust linkages emerge within groups without a loss of the unifying characteristics that span across CSFs.

‘CSF’ is often used as a unifying term, implying a collection of programs with similar philosophies, structures and outcomes. However, instead, the results suggest a collection of different marketing seafood programs, with at least eight areas of divergence among CSFs (Table 3). For example, CSF programs varied philosophically, with no two organizations expressing the same set of goals for their CSF program. CSFs also differed operationally,

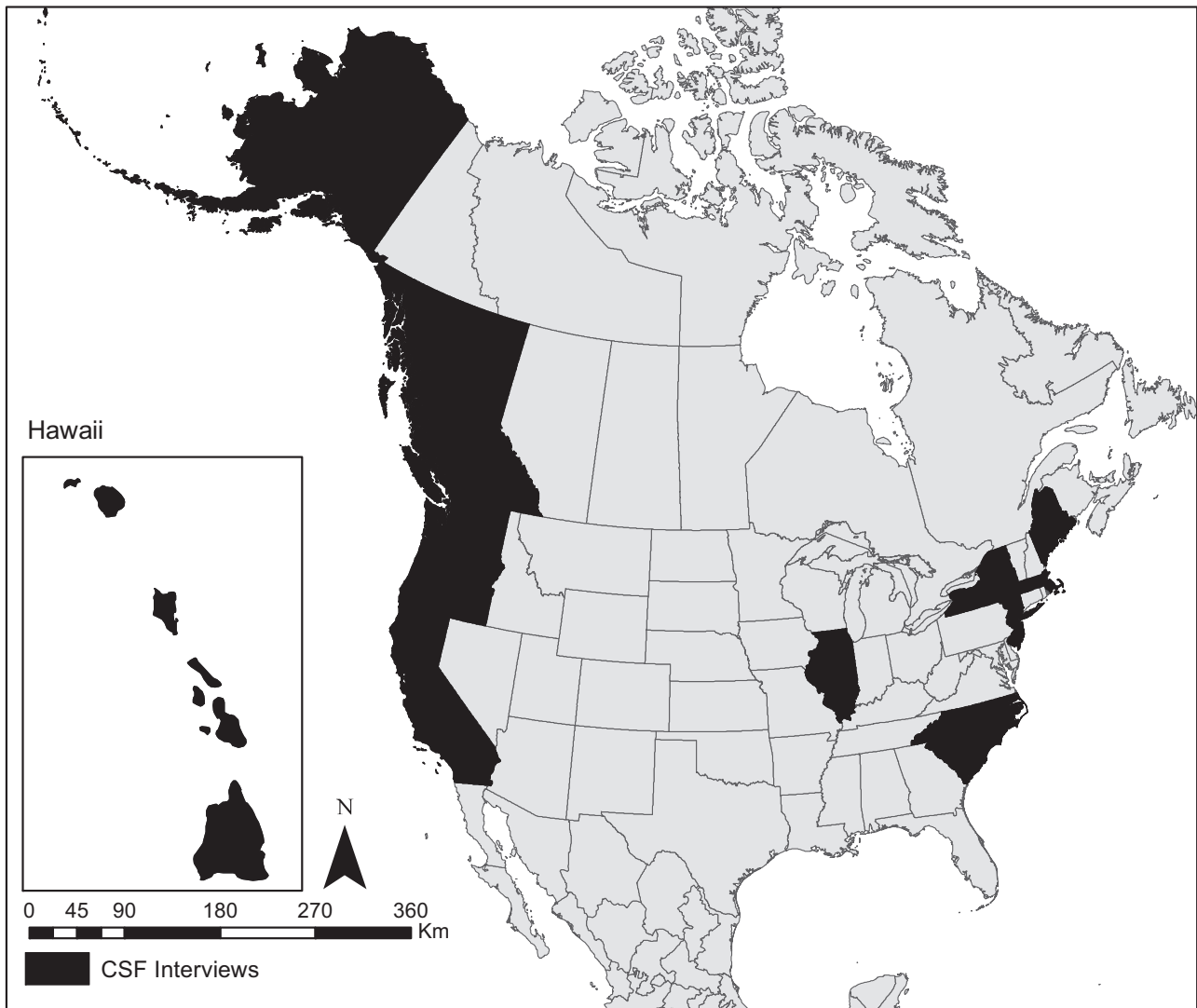


Fig. 1. Location (state or province) of interviewed CSFs.

using a variety of different models to facilitate sourcing, sales, and distribution of seafood, and structurally, with five different legal structures identified for organizations with CSFs, and no single structure governing more than half the organizations.

3.1. Unifying characteristics of CSF programs

While the divergent characteristics of CSFs are prominent throughout the results of this research, there are several attributes that CSFs do share in common (Table 3), equally important to understanding the core elements of CSFs.

3.1.1. Shortened supply chains

Not all CSF programs operate as direct-to-consumer marketing strategies, in which the fisher sells seafood directly to consumers. Instead, many CSF programs are actually intermediated marketing strategies, in which the seafood passes through at least one intermediate step in the supply chain before landing in the hands of consumers [10]. However, the characteristic shared by both of these strategies, direct-to-consumer and intermediated, is the emphasis on connecting seafood consumers and seafood producers [10]. Even if CSF programs are not always direct marketing arrangements, they still differ from mainstream supply chains by attempting to establish meaningful connections between consumers and producers. Most CSFs that do operate as intermediaries only source directly

from fishers ($n=9$), or prefer to source directly from fishers ($n=7$), resulting in a supply chain that has only one intermediary step between fishers and consumers.

3.1.2. Traceable chain of custody

Seafood sold through CSF programs is traceable to a specific fisher, boat or community of harvesters. The shortened chain of custody in CSF programs makes it easier to identify and follow the origin, processing history and distribution of a product through the entire supply chain [2]. Such accountability and transparency eliminates several of the issues associated with the lack of traceability in traditional seafood supply chains, such as opportunities for mislabeling and infiltration of illegally-caught seafood products [15,18]. CSF programs that operate as direct-to-consumer hold the entire chain of custody, making it reliably simple to trace the product from boat to plate. But even CSF programs that operate as intermediaries between producers and consumers are conscious of the product's chain of custody, and can trace it back to its source.

3.1.3. Domestically sourced seafood

CSFs are often associated with the local foods movement. However, only 82% of interviewed CSFs ($n=18$) consider their product to be sourced locally, and even those that did had varying ideas of what is considered 'local,' using a variety of

Table 2Summary of primary results from interviews with 22 CSFs (detailed results can be found in [Appendix A](#)).

Attribute	Characteristic	Response (n)	Results	
Philosophy	Purposes and goals of CSF	13	Directly connecting fishers with seafood consumers	
		10	Promoting local seafood	
		9	Environmental sustainability	
		9	Paying fishers a higher price for their catch	
		9	Gaining access to local markets for seafood products	
		7	Raise consumer awareness around fisheries and seafood	
		6	Increase consumer access to seafood	
		6	Promote small-scale or low-impact fisheries	
		5	Community development and support for fishers	
		4	Supply fresh, high quality seafood products	
		4	Increase profits	
		3	Promote underutilized species	
		2	Decrease food miles	
Structure	Emergence	16	Organization originated as CSF	
		6	Organization in operation prior to having CSF program	
	Legal structure	11	Limited Liability Company (LLC)	
		4	Corporation	
		3	Non-profit	
		2	Sole proprietorship	
		1	Cooperative	
		1	Unknown	
	Other seafood outlets	20	CSF is one of several product outlets for organization	
		2	CSF is the only product outlet for organization	
	Relative importance of CSF to the business	11	CSF program accounts for greatest proportion sales	
		9	CSF program has non-financial benefits to business	
		7	CSF program accounts for smaller proportion of sales than other outlets	
2		All outlets equally important to business		
Operations	Commitment system	16	Subscription-based system	
		4	Buy-down credit (credit pre-purchased at start of season and used as consumer chooses)	
		3	A la carte ordering	
		2	Single advanced ordering	
	Product form	15	Fresh products	
		5	Frozen products	
		3	Preserved products (i.e. smoked, canned or vacuum-packed)	
	Species included in box	10	Include whatever species are caught by fishers, some customization available to consumers	
		6	Include whatever species are caught by fishers, no customization available to consumer	
		5	Organization selects and includes only a few specific species	
	Species excluded from box	1	Consumer selects species	
		17	CSF excludes some species because of consumer preference, sustainability or value	
	Seafood sourcing	5	CSF does not exclude any species; everything that is caught is included	
		18	Source from a number of fishers	
		4	Source from self (i.e. only sell seafood caught by CSF owner themselves)	
		12	Source from entities other than individual fishers (i.e. processors, seafood businesses)	
		9	Only source directly from fishers	
		7	Prefer to source from fishers	
		18	Consider the seafood to be sourced 'locally'	
		4	Do not consider the seafood to be sourced 'locally'	
		19	Local defined geographically (i.e. where seafood is landed or harvested)	
		7	Local defined socially (i.e. where fishers live)	
	Distribution	1	Local defined historically (i.e. historical patterns of seafood supply)	
		19	Pick up locations	
		4	Home delivery	
		13	Weekly distributions	
		8	Bi-weekly distributions	
		4	Monthly distributions	
		3	Irregular intervals (distributed as seafood becomes available)	
		2	Seasonal distributions	
	Outcomes	Challenges and business constraints	6	Marketing and branding
			6	Workload
5			Costing	
5			Availability of products (i.e. due to inclement weather)	
4			Business skills	
4			Meeting customer demands	
4			Competing with other industry players	
4			Coordinating logistics	
3			Processing and cold storage capacity	
3			Sourcing product to meet CSF's standards	
3			Educating consumers	
3			Regulations and permitting	
2			Finances	

Table 3
Summary of unifying and divergent characteristics across interviewed CSFs.

Unifying characteristics	Divergent characteristics
<ul style="list-style-type: none"> • Shortened supply chains • Traceable chain of custody • Domestically sourced seafood • Effort to provide information to consumers about their seafood • Voluntary adoption of CSF designation 	<ul style="list-style-type: none"> • Legal organization • Goals of CSF program • Types and importance of other product outlets • Consumer commitment • Seafood species included in CSF box • Seafood sourcing practices • Frequency and method of CSF box distribution • Challenges associated with selling seafood through CSF program

geographic, social and historic definitions for the term (see Table 5, Appendix A).

While not all CSF programs indicated the seafood they provide is locally sourced, they are unified by the fact that they do all offer domestically sourced seafood. In an industry dominated by imported seafood, the opportunity to provide a venue for consumers to purchase domestically caught products is not an insignificant feature. The increasingly global nature of the seafood industry is displacing domestic fishers and pushing out many small-scale and community-based fishing operations in the United States. Supporting the consumption of domestic seafood through CSF programs can help to reduce the influx of imported products and preserve the livelihood of commercial fishers in the U.S. and Canada [7].

3.1.4. Provide information to consumers

All CSF programs provide consumers with access to additional information about the product they are purchasing, even those that do not specifically focus on consumer education and awareness as one of their primary objectives. This may include simply informing consumers of where the product was caught, how it was caught or who caught it; a significant improvement from much of the seafood purchased through traditional supply chains. Some CSFs even go a step further and provide more detailed information to consumers, such as the sustainability status of the species or broader habitat issues associated with the fishery.

Providing consumers with even the most basic information about their seafood increases overall awareness around regional fisheries, and also helps to raise the profile of seafood in society. Informing consumers about their seafood can draw attention to fish as a food source, not just a natural resource [16]. One interviewee explained the message they hope to convey to CSF consumers about the importance of wild seafood to the food system:

“Seafood is our last wild food source... and one of the most important foods in this discussion. Food is one of the best ways we connect to our surroundings and the people around us, and if we lose such connection to the wild and nature, we’re going down this really uncharted path in terms of civilization, only eating, producing and supporting input based food systems like agricultural models” (CSF Owner).

3.1.5. Voluntary adoption of CSF designation

At a fundamental level, the organizations interviewed for this research are united by their self-adoption of the term ‘CSF’ as a signifier of their business practices. While ‘CSF’ may mean different things to different adherents, all CSFs are using the term to identify their approach to selling seafood, demonstrating a desire among these organizations to be seen as part of a unified movement.

The term ‘CSF’ may attract organizations and consumers who link the term to particular cultural values or an idealized type of

relationship with fishers or with community. Parallel arguments have been made for the growth of CSAs in the United States, including the suggestion that CSAs represent a modern manifestation of American pastoralism [19] and, when applied to food systems, the term ‘local’ evoking images of small, independent or trustworthy farmers [17]. It is possible that the term CSF also represents elements of an ideology that appeals to consumers and as such, has gained legitimacy.

3.2. Contributors to CSF program diversity

While CSFs are united by their shortened supply chains, traceability, domestically caught products and effort to inform consumers about their seafood, there are also many points of divergence in CSF structure and operations (Table 3). Understanding that the term ‘CSF’ actually represents a variety of organizational arrangements that differ with respect to their philosophies, structures and operations is an important first step to bringing greater consistency to discussions of CSFs.

3.2.1. Lack of standardization of CSFs

The ‘CSF’ term is a self-adopted label and there are currently no formal regulations or widely accepted norms around what is, or should be, considered a CSF. The definition of a CSF has been left open to interpretation, and unrestricted use of the term has resulted in a variety of different types of organizations self-classifying as CSFs. For example, not all CSF programs are operated as direct marketing strategies, in which the fisher owns and operates the CSF and sells his or her seafood directly to the consumer; only 18% ($n=4$) of the interviewed CSFs operate in this way. Instead, most CSFs (82%, $n=18$) are actually arranged as intermediary marketing strategies, with CSF owners and operators sourcing seafood from a number of fishers to then sell to consumers.

Given the high degree of variability identified in the organizational structure, operative procedures, and goals of CSFs, standardizing the term presents a number of challenges. How a CSF should be defined is currently a matter of opinion. Through the interviews it became clear that several CSF owners were aware of this, and were making conscious efforts to advance or defend a particular vision. Even CSF organizations that self-classified as ‘true’ CSFs have diverging ideas of how to standardize the model, as illustrated in the following excerpts:

“Some dealers who have retail space have created, or simulated, what they *believe* are CSFs, which are actually buyers clubs, because a true CSF is fishermen driven, it’s not a top down approach from a retailer or wholesaler, it has to come from the fishermen” (CSF Owner).

“The way we mathematically quantify how you say who *is* and who *isn’t* is by the chain of custody... Here’s the basic math: you just count the chain of custody, how many hands it touches from the actual harvester, and anything beyond three is no longer a [CSF]” (CSF Owner).

There is also a lack of standardization around the terms used by CSFs, such as ‘local’, ‘sustainable’ and ‘community’. In many cases, creating a connection to these concepts for the consumer underlies the marketability of CSFs, and provides incentive for adoption of the designation. As such, the way in which CSF organizations engage with these concepts and communicate them to the consumer, or work to establish industry standards around them is a matter of active interest for CSF owners and coordinators, providing a forum through which these concepts are negotiated and contested in increasingly direct ways.

Similar challenges with the lack of standardization and regulation have been observed with CSA programs in the United

States [20]. The rapid growth and expansion of the CSA model over the last several decades recently prompted California to create a statutory, legal definition of the term ‘CSA’ and to establish formal regulations to regulate the development of CSAs, the first state in the U.S. to do so [9]. CSFs may face similar legislation as they continue to gain traction in the market.

3.2.2. Differing goals of CSFs

CSF programs are often assumed to share a common set of goals. According to Ref. [4]: “The main goals of the CSF model are to increase profits for the local fishermen, provide high-quality seafood to interested consumers, and directly engage consumers using fishery products”. However, as the results of this study suggest, the suite of CSF goals are much broader than this (Table 2), and not all CSF programs identified these goals. Less than half of the CSFs interviewed stated that providing fishers with a higher profit for their catch as a goal, and only a few mentioned providing consumers with high-quality seafood products as a goal. Moreover, promoting local and sustainable seafood, gaining access to local markets for seafood products, raising consumer awareness and promoting small-scale fisheries were all just as common as the goals mentioned by Ref. [4].

CSF program goals are intended to dictate, at least in part, the structure and operations of the organizational arrangement, and consequently the benefits the particular CSF can provide. For example, one CSF aims to provide high quality, transparent seafood from Alaskan fishing communities to consumers in the Midwest. In order to achieve this goal, the organization ships seafood to consumers over 4000 km from where it is harvested. While this type of operation contradicts the core principle of the ‘locavore’ movement that is often associated with CSFs (i.e. [6,13,14]), it allows the CSF to achieve its particular goals, which is something that they believe ultimately honors the purpose of CSF programs.

Terms that are commonly used to describe the goals of CSF programs, such as ‘local’ and ‘sustainable,’ are themselves riddled with variability, which leads to yet another layer of diversity in CSF operations; CSFs with similar goals may in fact be pursuing very different outcomes in practice. As the results of this study indicate, the term ‘local’ is defined in a number of ways by CSFs, employing different geographic, social and historic factors (see Table 5, Appendix A), and as such, CSFs that aim to promote ‘local’ seafood may be delivering very different products – a CSF program that defines ‘local’ as fish caught within a few kilometers from where consumers reside will operate differently than a CSF that defines ‘local’ as where the fishers live.

The same is true for the term ‘sustainable’. CSF programs can pursue sustainability goals in a number of different ways, such as reducing food miles, creating markets for bycatch and waste products, and promoting lower-impact fishing gear [12]. The particular elements of sustainability pursued by a CSF will influence the practices of the program. One CSF in California, for example, aims to improve sustainability by supporting fishers that use fixed gear, such as hook and line, while another in Alaska does so by attempting to keep locally caught seafood available to residents in the local community. Although both support ‘sustainable’ seafood, the unique goals of each CSF program will ultimately dictate how it operates – one sources fish caught using a particular method, while the other sources fish caught in a particular place.

3.2.3. Differing local contexts for CSFs

CSFs are also shaped by the local context within which they operate. Shellfish harvesters in Massachusetts, for example, are prohibited from selling their products directly to consumers; state law requires harvesters only sell shellfish products to wholesale dealers permitted by the Division of Marine Fisheries and the Division of Food and Drugs [11]. While CSFs are typically

considered a direct-to-consumer marketing strategy that connects consumers directly with fishers, regulations in Massachusetts prohibit some fishers from doing so, and as such, require intervention by a third party.

Regional fishing regulations may also shape the operations of a CSF. For example, CSF programs that provide salmon from Alaska are restricted to a short fishing season during the summer. As a result, CSF owners and operators have, in some cases, tried to find innovative ways for their CSF to generate revenue streams that extend beyond the short fishing season, such as selling ‘freezer shares’ of preserved product throughout the year. In places where fisheries are highly targeted and generate low bycatch to begin with, promoting underutilized species may not be relevant, and selling high-value species such as salmon may make the most sense given the fishery in which the CSF operates.

The broader food landscape within which the CSF operates is also a factor. In places where seafood has not generally been accessible or popular, promoting the consumption of even the most mainstream seafood products may be a challenge, let alone the more unfamiliar or uncommon species. In these ‘seafood-limited’ areas, consumers may only have experienced seafood in restaurants and be unfamiliar with cooking it; a CSF in such an area may need to take into account the culinary skills and experiences of their consumers and select species that are relatively easy to prepare. Restaurants also play an important role in the local foodscape, and may contribute to what a CSF is able to offer. One CSF in South Carolina, for example, has had great success marketing underutilized species through their CSF program, in part because of the support of local chefs in the area who have taken the opportunity to promote the same species on their menus.

In some locales, consumers may already have direct access to fresh, high quality, local seafood, and CSFs may instead serve another purpose. For example, both CSFs in North Carolina focus primarily on providing seafood to communities of inland consumers located in urban centers, rather than serving the coastal communities where it was caught.

3.2.4. Differing product outlets of organizations with CSFs

CSFs are not necessarily stand-alone institutions or organizations. Rather, CSFs are an approach to selling seafood – strategies employed by an organization to market seafood products. While most of the interviewed organizations emerged specifically for the purpose of operating a CSF program (73%, $n=16$), six organizations did not originate as CSFs and were in operation prior to the start of their respective CSF program. Only two of the interviewed organizations *only* sell seafood through their CSF programs; all other organizations also sell seafood through other product outlets, such as wholesale to restaurants and retail stores. The relative importance of the CSF program to the business also varied, accounting for the greatest proportion of the organization’s seafood sales for some ($n=11$) and the smallest proportion for others ($n=7$). The degree of diversification and relative importance of the CSF strategy to the business plays an important role in determining how that CSF program is structured.

The perishable nature of seafood makes holding an inventory of product difficult, particularly without compromising the quality or altering the form of the product. Having multiple outlets through which products can be sold helps to offset some of the risks associated with selling a perishable product. If a CSF program is either one of many product outlets through which an organization distributes its product, or the smallest volume of sales relative to the other outlets, advanced consumer commitment may be less critical, and as a result, CSF programs that represent only one of several outlets for the organization may be able to offer more flexibility and choice to the consumer. The same is true for organizations that are able to create value-added products from excess

seafood; one CSF on the west coast, for example, is able to smoke or can any seafood that is not selected by CSF consumers. Having this option eliminates the need to know exactly how much seafood is needed for the CSF program.

3.3. Grouping of CSF programs

Advocates of the CSF model need to be conscious of the diversity of arrangements that this increasingly common term represents, and to account for this when commenting on how CSFs operate and what they are able to provide. Most CSFs are tailored to provide a subset of the benefits commonly associated with CSF programs, and very few, if any, are structured in a way would allow all potential benefits associated with CSFs to be achieved.

A system to differentiate types of CSF programs could help draw attention to this fact, and help ensure the potential outcomes or benefits of a particular CSF arrangement are presented accurately. Three subgroups of CSF programs have been identified based on the results of this study (Table 4):

1. **Harvester focused CSFs**, typified by a direct marketing structure and goals oriented towards improving the economy and resilience of fishing communities
2. **Consumer focused CSFs**, typified by an intermediary marketing structure and goals oriented towards educating and connecting consumers with their seafood system through the CSF experience
3. **Species focused CSFs**, typified by a focus on directly connecting fishers and consumers dealing with a few high value species. This type overlaps with the other two in terms of structure, but is distinct in that the seafood often travels greater distances.

CSF programs in a given category share many similarities in structure, operations and philosophies. Although a given CSF may have characteristics in common with more than one category, generally speaking it is more strongly connected with one category than the others. It is equally true that not all characteristics common to the category will be present in every CSF in that category; these programs must still be considered within the local context in which they operate.

The attempt to classify CSFs into these subgroups based on their shared characteristics is not to create silos in which they are separated from one another, but rather to highlight the further unification that emerges among each cohort. Because no single narrative is able to tell the story of all CSFs given the range of diversity that exists among them, classifying CSFs can help bring greater clarity and cohesion to understandings of the CSF movement as a whole.

Although CSFs aim to have important social, economic and environmental benefits, what exactly those benefits are depends on how the CSF is organized. Grouping CSFs as either harvester focused, consumer focused or species focused based on their primary attributes can help us more accurately describe how subgroups of CSFs are structured, and consequently, correctly discuss the benefits these arrangements are able to provide. While some benefits can be applied broadly across the board to all CSFs, such as the fact that CSFs foster a shortened chain of custody for seafood products, others benefits need to be applied more cautiously on a case-by-case basis. For example, the benefits described by Ref. [21] suggest that CSFs using direct marketing have the potential to build social capital through increased cooperation and communication among fishers and consumers. As suggested by the authors, such a dynamic may be most applicable to Fisher Focused CSFs, where fishers are placed in direct contact with consumers,

Table 4
CSF subgroups, classified based on shared characteristics.

Characteristics	Harvester focused	Consumer focused	Species focused
Goals	Goals are fisher-focused (i.e. paying a higher price to fishers)	Goals are consumer-focused (i.e. raising consumer awareness)	Goals are diverse
Ownership	Owned and operated by fisher	Owned and operated by an intermediary	Owned and operated by fisher or intermediary
Legal constitution	LLC, Cooperative or Corporation	LLC or Corporation	LLC or Non Profit Organization
Importance of CSF	CSF is often the smallest proportion of sales	CSF is often the largest proportion of sales	CSF is often the largest proportion of sales and important to the business for non-financial reasons
Commitment system	Majority use a buy-down system	Majority use a subscription system with set pick-up times	Less likely to require a subscription, and often offer single advanced or a la carte ordering
Distribution frequency	Seafood is distributed as it becomes available, rather than set intervals	Seafood is distributed on a weekly or bi-weekly basis	Seafood is distributed monthly, seasonally or annually
Distribution method	Consumers pick up seafood from the dock or from pick-up locations	Consumers pick up seafood from pick-up locations	CSF boxes are often home delivered to consumers
Species included	Include a diversity of species in CSF box	Include a diversity of species in CSF box	Provide only specific species
Species exclusions	Species are based on whatever is caught, although some species may be excluded because of consumer preference or sustainability factors	Species are based on whatever is caught, although most offer consumers some customization options	Most provide only high-value types of seafood and mostly products from Alaska
Product form	Mostly fresh products	Mostly fresh products	Fresh and frozen products
Sourcing	Source from self	Source from a number of fishers and entities	Source from self or a small number of fishers
Local seafood	Majority define local by where the fish is caught	Majority define local by where the fish is landed	Majority define local socially (i.e. local fishers)

and less so to Consumer Focused CSFs which operate through intermediaries. The same can be said for other benefits discussed in the CSF literature, such as the idea that CSFs can develop markets for bycatch and promote the use of underutilized species [12] – this may be most applicable to Harvester Focused and Consumer Focused CSFs and less so to Species Focused CSFs, which are often centered around providing high-value species like salmon.

3.4. Case studies

To illustrate these three subgroups in greater depth, three cases that demonstrate their properties and draw attention to key themes that have emerged in this analysis are provided. In presenting these cases it is important to consider commonly held definitions of CSFs expressed in prior literature, such as that used by Ref. [5]:

“A CSF involves an up-front purchase of shares in return for a weekly or bimonthly delivery of fresh, locally caught fish. As in community-supported agriculture (CSA), CSF members agree to take what they are given in their “cooler” (i.e., what has been caught)” ([5], p. 89)

This definition, not unlike others used in the literature and popular media, reflects exposure to work with CSFs that operate as direct to consumer marketing entities, use a subscription system, pre-arrange deliveries at set intervals, source locally caught fish, and include whatever species are caught by the fishers in their seafood boxes. While some CSFs certainly operate in such a fashion, such as Walking Fish in North Carolina, many of the assumed qualities of CSF programs present in Walking Fish are not necessarily present in most CSFs. For example, Walking Fish is the only cooperative among the 22 interviewed CSFs in this study. Though at least two other cooperative CSF is known to exist, it is clear that alternative arrangements have been more readily adopted in most production contexts. While Walking Fish uses a subscription-based model that has become the assumed norm for CSFs, at least three other models are used and many CSFs are beginning to move away from using structured subscription systems. Although weekly or biweekly deliveries of local seafood are often assumed to be the crux of the CSF premise, some CSFs do not choose to source products locally or choose to schedule set delivery frequencies.

In considering this analysis, it has become clear that no single CSF or type of arrangement can serve as a model for understanding all existing CSFs. Because Walking Fish, and a few other CSFs that operate in a similar fashion, have received the majority of the attention, the arrangement of this subset of CSFs has influenced understandings of the CSF movement as a whole. This is not to say that other CSFs do not share many common characteristics with Walking Fish, but to underscore that a richer array of cases is needed to fully understand these organizations and their CSF programs. In the following cases, one example from each of the previously introduced CSF subgroups is presented to explore how the diversity of CSFs allows for the provision benefits within a variety of contexts.

3.4.1. Harvester focused CSF: Cape Cod Community Supported Fishery

Located in Chatham, Massachusetts, Cape Cod Community Supported Fishery is owned and operated by a family of fishers who started selling seafood in the 1950s. They use traditional fishing weirs, passive net structures attached to semi-permanent poles inserted into the seafloor that impound fish as they swim. The live fish are scooped out of the water by fishers on small boats and taken to the dock for sale.

The CSF program, which started in 2010, was added to the business to provide an alternative market for their products, majority of which is sold to out-of-state wholesalers. The season lasts

for five weeks between May and June, and operates on a buy-down credit system; consumers purchase a credit at the beginning of the season and are notified of the daily catch via email, phone or text message, which they can order and then pick up when the boat returns to the dock. While still buying-in for the season, as they would with a subscription based system, consumers also receive the flexibility of selecting when they would like to receive their seafood and what species they would like from the catch.

Rather than having consumers “agree to take what they are given” [5], Cape Cod Community Supported Fishery has found a way to allow consumers some flexibility with the timing and contents of their seafood boxes without sacrificing the need to operate in a supply-driven manner, or the benefits of having consumers buy-in upfront for the season. This system is supported by the fact that the CSF program is just one of many outlets the family has for their seafood products. By having consumers come to the dock to pick up their seafood, Cape Cod Community Supported Fishery is also able to foster direct relationships with the consumers and provide a ‘face’ to their fish, which is potentially one of the most important benefits of being a Harvester Focused CSF.

3.4.2. Consumer focused CSF: Community Seafood

Community Seafood is a CSF in Santa Barbara, California that was started in 2012. Only a small portion of their product is sold as an “add on” item to a local CSA, and the majority of their business comes from the CSF program. Community Seafood aims to provide consumers with easy access to a product they can feel confident is fresh, local and sustainable. The CSF was formed as a way to educate the community about local fisheries and improve the access to the local seafood available in the area.

The seafood is sourced from a variety of fishers, as many as sixty individuals throughout the season, providing a high diversity of species in Community Seafood’s CSF boxes, including a variety of fish species as well as shrimp, crab, oysters, mussels and clams. Although consumers do not have a choice in the seafood species they receive in their box, they do have different customization options when they sign up, such as opting out of receiving shellfish or choosing not to receive any whole fish or difficult to prepare species like squid. The CSF operates year round, and seafood deliveries are made on a weekly or bi-weekly basis. Consumers are required to sign up for a subscription with a minimum of four deliveries to participate in the CSF; however, consumers are able to place their order on unlimited delivery hold, providing them with more flexibility than a standard subscription based system.

Rather than being owned and operated by a family or group of fishers, such as Walking Fish or Cape Cod Community Supported Fishery, Community Seafood is operated as an intermediary organization, serving as a conduit between consumers and harvesters. While they are not necessarily able to provide the same direct interaction between fishers and consumers as these other CSFs do, their position allows them the flexibility of sourcing from a number of fishers in the community and providing a large variety of seafood to consumers. It is also conducive to incorporating many types of expertise into their business; the Community Seafood team includes ten employees with responsibilities including operations, accounts, logistics, technology, graphic design and communications. Having such a diverse suite of people operating the CSF has potential benefits from a business management perspective that Harvester Focused CSFs may not have access to.

3.4.3. Species focused CSF: Sitka Salmon Shares

Sitka Salmon Shares aims to provide sustainably caught seafood from Alaska to the Midwest states of Illinois, Iowa, Minnesota, Indiana, Michigan, and Wisconsin. While Sitka Salmon Shares also sells some product wholesale and through retail outlets such as Farmer’s

Markets, the CSF program is the largest portion of their sales. The CSF focuses on several species of salmon, as well as a few other high-value species such as cod, halibut, crab and prawns, all sourced from between eight and 10 small-boat fishing families in Sitka and Juno. Consumers purchase shares in advance, committing to three, five or seven monthly home deliveries of frozen and vacuum-sealed seafood. The goals of the CSF include bringing value to small-boat independent fishing families in Alaskan fishing communities, providing sustainable and transparent fish to Midwesterners who have not had access to high quality seafood, and bringing about change in the seafood industry and food system by moving towards support for small producers, using sustainable harvest methods, and creating a commitment to a working waterfront.

Unlike the commonly held assumption that CSFs provide whatever assortment of fish that is caught, including otherwise underutilized species, Sitka Salmon Shares intentionally targets certain species with a purpose. Given the foodscape in which Sitka Salmon Shares operates, where many people are unfamiliar with preparing and eating seafood, focusing on species like salmon that are familiar to consumers is potentially the most appropriate for the context, allowing the CSF to operate in a way that meets consumer needs, as well as those of the Alaskan fishers.

While Sitka Salmon Shares does not necessarily source seafood that is geographically local, such as that of other CSFs like Walking Fish, they work to provide seafood that resonates with the values often associated with local seafood, such as creating a sense of community, supporting small-boat fishers and celebrating food and fishing culture, both in the Midwest and in Alaska.

4. Conclusions

The rapid growth of CSFs is a testament to the widespread enthusiasm that consumers and producers have for alternative seafood marketing arrangements. The diversity characterized in this research is unsurprising given the broad geographic and economic contexts in which CSFs are emerging. Local ecologies, pre-existing supply chain dynamics, histories, politics and personal priorities all work together to shape the forms that CSFs take. The analysis presented here brings this conceptualization of what a CSF really is into focus. As industry members and managers respond to CSF diversity, it is important they recognize that the term 'CSF' does not currently refer to a specific structure or type of organization, but rather an approach to seafood marketing used by a variety of organizations with broadly similar production philosophies centered on engaging consumers around traceable, domestically sourced seafood. This reality requires a measured approach to making claims about the benefits and impacts of CSFs, as the differences among CSF types may condition the social and economic benefits they provide.

Diversity also comes with difficulties, as industry members all have a stake in what the CSF designation signifies due to the value it creates for their businesses. The question of establishing common social or environmental standards for CSFs is likely to become an important issue as CSF growth continues. While commonly recognized criteria may provide considerable benefits for CSFs and consumers, it is important that such discussions come about through meaningful and inclusive dialog among industry members and with consideration of consumer priorities.

Acknowledgments

The authors would like to thank all of the CSF interviewees for generously sharing their time and providing valuable insights on Community Supported Fisheries.

Appendix A. Supplementary material

Supplementary data associated with this article can be found in the online version at <http://dx.doi.org/10.1016/j.marpol.2016.01.007>.

References

- [1] H.R. Bernard, *Research Methods in Anthropology: Qualitative and Quantitative Approaches*, Rowman Altamira, United States, 2011.
- [2] M. Borit, P. Olsen, Evaluation framework for regulatory requirements related to data recording and traceability designed to prevent illegal, unreported and unregulated fishing, *Mar. Policy* 36 (1) (2012) 96–102, <http://dx.doi.org/10.1016/j.marpol.2011.03.012>.
- [3] J.D. Brewer, The ethnographic critique of ethnography: sectarianism in the RUC, *Sociology* 28 (1) (1994) 231–244, <http://dx.doi.org/10.1177/0038038594028001014>.
- [4] A. Brinson, M.-Y. Lee, B. Rountree, Direct marketing strategies: the rise of community supported fishery programs, *Mar. Policy* 35 (4) (2011) 542–548, <http://dx.doi.org/10.1016/j.marpol.2011.01.014>.
- [5] L.M. Campbell, N. Boucquey, J. Stoll, H. Coppola, M.D. Smith, From vegetable box to seafood cooler: applying the community-supported agriculture model to fisheries, *Soc. Nat. Resour.* 27 (1) (2014) 88–106, <http://dx.doi.org/10.1080/08941920.2013.842276>.
- [6] R. Conniff, Hook, Line, and Sustainable: 5 Ways Community-Supported Fisheries Trump Supermarket Seafood. Retrieved from: (<http://www.takepart.com/article/2014/05/06/how-put-really-legal-seafood-dinner-plate>) (accessed 26.02.15) (2014, May 6).
- [7] K. Ellison, In Birthplace of Local Food, Fish Imports Take Over the Menu. *The New York Times*. Retrieved from: (<http://www.nytimes.com/2009/12/11/dining/11sffish.html>), (2009, December 11).
- [8] R. Feagan, The place of food: mapping out the "local" in local food systems, *Prog. Hum. Geogr.* 31 (1) (2007) 23–42, <http://dx.doi.org/10.1177/0309132507073527>.
- [9] M. Grant, On the Heels of Farm-to-Fork Week, Gordon Bill Supporting Expansion of Community Supported Agriculture Signed by Governor Brown. Retrieved from: (<http://asmcd.org/members/a24/news-room/press-releases/on-the-heels-of-farm-to-fork-week-gordon-bill-supporting-expansion-of-community-supported-agriculture-signed-by-governor-brown>), March 23, 2015, (2013, October 1).
- [10] R. King, M. Hand, G. DiGiacomo, K. Clancy, M. Gomez, S. Hardesty, ..., E. McLaughlin, Comparing the Structure, Size, and Performance of Local and Mainstream Food Supply Chains (No. ERR-99). U.S. Department of Agriculture, Economic Research Service, 2010.
- [11] Massachusetts Department of Public Health, 105 CMR 533.000 Fish & Fishery Products. Retrieved from: (<http://www.mass.gov/eohhs/docs/dph/regs/105cmr533.pdf>), 1999.
- [12] L. McClenachan, B.P. Neal, D. Al-Abdulrazzak, T. Witkin, K. Fisher, J.N. Kittinger, Do community supported fisheries (CSFs) improve sustainability? *Fish. Res.* 157 (2014) 62–69, <http://dx.doi.org/10.1016/j.fishres.2014.03.016>.
- [13] NOAA Fisheries, Laying a Solid Foundation for Community Supported Fisheries, Retrieved from: (http://www.fisheries.noaa.gov/stories/2012/06/06_04_12csf_summit.html), (February 28, 2015.), 2012, June 4.
- [14] Northwest Atlantic Marine Alliance, Community Supported Fishery, Retrieved from: (<http://namanet.org/our-work/market-transformation/community-supported-fishery>), (March 6, 2015), 2014.
- [15] Oceana, Seafood Fraud: Stopping Bait & Switch, Retrieved from: (http://oceana.org/our-campaigns/seafood_fraud), (March 1, 2015), 2015.
- [16] J. Olson, P.M. Clay, P. Pinto da Silva, Putting the seafood in sustainable food systems, *Mar. Policy* 43 (2014) 104–111, <http://dx.doi.org/10.1016/j.marpol.2013.05.001>.
- [17] M. Ostrom, Everyday meanings of "local food": views from home and field, *Community Dev.* 37 (1) (2006) 65–78, <http://dx.doi.org/10.1080/15575330609490155>.
- [18] G. Pramod, K. Nakamura, T.J. Pitcher, L. Delagran, Estimates of illegal and unreported fish in seafood imports to the USA, *Mar. Policy* 48 (2014) 102–113, <http://dx.doi.org/10.1016/j.marpol.2014.03.019>.
- [19] M. Press, E.J. Arnould, Legitimizing community supported agriculture through American pastoralist ideology, *J. Consum. Cult.* 11 (2) (2011) 168–194, <http://dx.doi.org/10.1177/1469540511402450>.
- [20] L. Stanford, The role of ideology in New Mexico's CSA (community supported agriculture) organizations: Conflicting visions between growers and members, in: R.R. Wilk (Ed.), *Fast Food/Slow Food: The Cultural Economy of the Global Food System*, Rowman Altamira, United States, 2006, pp. 181–200.
- [21] J.S. Stoll, B.A. Dubik, L.M. Campbell, Local seafood: rethinking the direct marketing paradigm, *Ecol. Soc.* 20 (2) (2015) 40–54, <http://dx.doi.org/10.5751/ES-07686-200240>.
- [22] J.S. Stoll, T.R. Johnson, Under the banner of sustainability: the politics and prose of an emerging US federal seafood certification, *Mar. Policy* 51 (2015) 415–422, <http://dx.doi.org/10.5751/ES-07686-200240>.