

Maine Seafood Study

A set of tools for integrating Maine seafood
into food distribution systems.

January 15, 2015



Capital *for* Opportunity *and* Change

About CEI: CEI is an expert in rural business funding, development and financing. A private, nonprofit Community Development Corporation (CDC) and Community Development Financial Institution (CDFI) based in Wiscasset, Maine, CEI was founded in 1977 to develop job-creating natural resources and small business ventures in rural regions of Maine, and has grown to serve business funding all of Maine, its primary market, and areas of northern New England and upstate New York. CEI's mission is to create economically and environmentally healthy communities in which all people, especially those with low incomes, can reach their full potential.
<http://www.ceimaine.org/>

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Executive Summary

In the current movement to support locally produced foods and rebuild local and regional food systems, the emphasis to date has been on agricultural products. Seafood (including aquaculture products) has not been well-integrated into these discussions and efforts. To advance the goal of integrating seafood into a comprehensive Maine food distribution and sales network, CEI has researched and inventoried the seasonality, sources, and market utilization of locally produced seafood within the state. Only by understanding the status quo of current patterns of production, destination, and use can a viable alternative distribution plan be created in collaboration with agricultural products.

In addition to the research findings, CEI has developed an online tool to help potential buyers at many different levels of geography and distribution, find the products and the companies that sell them. The different resources provided by the online tool include: seafood products available throughout the year in Maine waters, suppliers of value added seafood, Maine based processors and their products, distribution and transporting companies carrying Maine seafood, cold storage warehouses and facilities in Maine, buyers who operate at the Portland Fish Exchange, aquaculture lease holders and the products they offer.

Very few “food hubs” in New England currently offer Maine seafood. The barriers that these businesses have experienced or anticipate experiencing include a wide range of reasons: a lack of assets to handle seafood (refrigeration, freezer, storage, trucks, transportation), Maine seafood is not always considered a “local” option to source, many food hubs aggregate vegetables and simply don’t have the space, capacity or resources to add seafood, additional staff would be required, accessing capital can be difficult to invest in the necessary infrastructure, freshness & quality concerns and a lack knowledge of seafood industry.

The intended goal of our research findings and online resource tool is to help educate food consumers at many different levels about the opportunities for gaining access to Maine seafood. By purchasing locally produced seafood consumers are directly supporting harvesters and their families, increasing the value of Maine’s seafood industry, improving our food security in an effort to become less reliant on overseas fisheries, encourage healthy eating habits and support the economic stability of our fishing industry. Educated consumers can use the information presented in the study and the online tool to become familiar with the Maine seafood industry and the robust choices it has to offer.

Methodology

CEI researched and inventoried the source, transportation, and market utilization of locally produced seafood within the state. The list below identifies some of the different areas of the seafood “food system” that we studied.

- Seafood & Aquaculture marine resources and value added products
- Wholesale Seafood dealers & Seafood processing facilities
- Cold Storage & Commercial ice machines
- Transportation companies and the routes they travel
- Other standalone product and service companies
- Maine Farmers markets

Useful Outcomes for the Fishing Industry & New England Food Hubs

- Identify the challenges and opportunities to creating access to healthy seafood
- Inform people/companies of distribution and sales opportunities for Maine seafood (in and out of state)

- Align Maine seafood handlers with “Food Hubs”¹ in New England who are seeking seafood products
- Help businesses put more Maine origin seafood into retail markets

The Gulf of Maine

Coastal Maine is a contiguous region encompassing ~3,500 miles of coastline and eight counties, stretching eastward from the New Hampshire line to the international border with New Brunswick, Canada. More than half (54%) of the state’s population of 1,328,361² live within Maine’s coastal counties: York, Cumberland, Sagadahoc, Lincoln, Knox, Waldo, Hancock and Washington. The region’s essential resource is the Gulf of Maine, one of the world’s richest habitats for fish and shellfish. In 2012, according to the National Oceanic and Atmospheric Administration (NOAA) Maine’s seafood industry accounted for 32,971 14 jobs when accounting for: commercial harvesters (fishermen), seafood processors, seafood dealers, seafood wholesalers and distributors and retailers³. In 2013, the Maine Department of Marine Resources reported that there were 7,320 commercial fishermen, of those 4,239 were active commercial lobster harvesters. The top five fisheries in terms of active commercial harvesters were lobster, soft shell clams with 1,749, eel with 759, and marine worms with 652 and periwinkles with 613⁴. There is also a large mix of marine aquaculturists ranging from small part-time growers to full-time farmers working for themselves to large companies with many employees, lease sites, and processing facilities. As of September 2014 there are 74 molluscan shellfish leases (including experimental leases), totaling 608 acres, 4 experimental seaweed leases (6.92 acres), 2 green sea urchin leases (4 acres total) and 26 finfish leases, (665 acres total) located in marine and estuarine waters along the Maine coast⁵. This summary does not include the Limited Purpose Aquaculture Licenses (LPAs) that are issued or renewed annually, each for a maximum area of 400 square feet. All said, there is a significant amount of cultured seafood harvested in the state of Maine that accounts for \$79 million in wholesale sales annually.⁶

Commercial Harvesters in Maine’s Coastal Counties

If you look at county level data of where the majority of Maine commercial harvesters hold licenses (see graph below), you can quickly see that Washington and Hancock are the two counties most dependent on marine resource harvesting. Knox, Lincoln and Cumberland are not far behind.

¹ The USDA’s working definition of a food hub is “a centrally located facility with a business management structure facilitating the aggregation, storage, processing, distribution, and/or marketing of locally/regionally produced food products.”

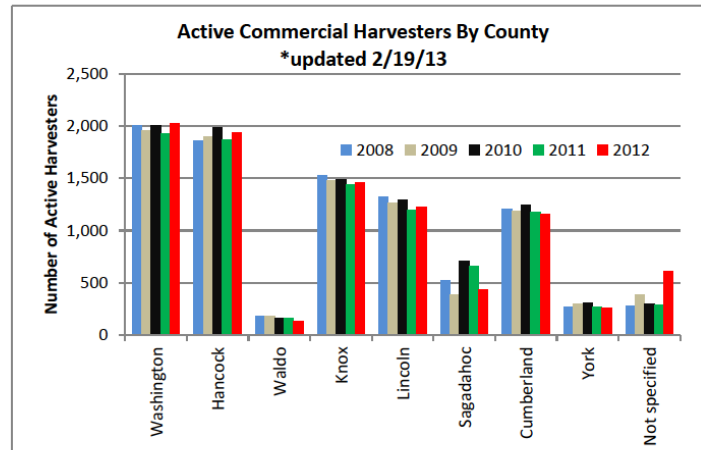
² According to data compiled and analyzed from the United States Census Bureau website <https://www.census.gov/2010census/popmap/ipmtext.php?fl=23>

³ http://www.st.nmfs.noaa.gov/economics/publications/feus/fisheries_economics_2012

⁴ <http://www.maine.gov/dmr/news/2014/2013Landings.htm>

⁵ According to personal communications with the Maine Department of Marine Resources staff September 2014.

⁶ John Rebar, University of Maine Cooperative Extension. “The New Food Based Economy – Local Food Means New Opportunity for Maine” presentation. Economic Development Council of Maine. September 19, 2014.



Seafood Products & Availability

Maine offers a tremendous amount of seafood options for consumption. Providing not just raw harvested species, many companies in Maine are adding value to our marine resources and making them available to consumers worldwide. In our research we have reviewed several state license/permit holder lists from 2012 (Maine Department of Marine Resources, Maine Seaweed Council, Maine Harbor Masters Association, Maine Department of Agriculture Division of Quality Assurance). After reviewing the lists we have attempted to identify the significant players in the industry that are transporting, processing and selling seafood in volume. Since one of the purposes of our research is to help make buyer/seller connections within the industry, we started with baseline information for commercial marine species (excluding lobster) that are reportedly landed and available for sale in the state of Maine. In our research outline we placed less of an emphasis on Maine lobster because of the size and ubiquitous scope of the lobster fishery (5,000+ active Maine lobster fishers land about 100+ million pounds annually along the entire coast), we did not see a need for this study to identify over-the-wharf lobster resources. Essentially live lobster may be accessed anywhere at almost any time throughout the year. However, we do see a need to determine the general locations along the coast and amounts of other seafood landings and how they are currently distributed and stored awaiting sale. Having said this, many wharves/piers, trucking companies, seafood processors and wholesalers do handle lobster in addition to other seafood landings so lobster information is accounted for in this report.

CEI's Online Resource

As a supplement to our written findings and a way to present a lot of information in digital format, we have created an online resource (on CEI's website) that enables a user to see and search a list of raw and processed seafood products by species or by business name to see who is carrying/selling products in Maine. We feel that this is likely one of the most useful components of the project and should be viewed in collaboration with reading the study. This tool can help individual consumers, restaurants, wholesalers, food hubs and other food system businesses to learn about the availability of raw and processed seafood products. The intention is to help food buyers contact businesses directly about the availability of products and prices. It provides an avenue where buyers can potentially contact sellers outside of their usual food sourcing avenues as a way to source something new. We found that price

points for seafood were difficult to gauge. Each business sets their prices and they can fluctuate greatly daily, monthly or yearly depending on the season, species, amount of product available, imported seafood, the weather, holidays, etc. Prices for the fish landed at the Portland Fish Exchange are available as public information and show extreme variability from day to day⁷. We feel that price point information is so volatile that it did not make sense to track that information.

Online Resource Data Tables

There are seven data tables that house different information, they include:

The first table shows What's in season in Maine waters, and when? This provides a snapshot view of the availability of marine resources (raw products) throughout the year in Maine waters. This is based on a design originally created by Catherine Schmitt at the Maine Sea Grant College Program. This can change over time due to a number of factors including but not limited to: state and federal regulations, environmental conditions, species biology, life history, migratory behavior, taste, quality and market factors. In the table, the top section represents "Peak Season", the mid section indicates "In Season" and the bottom section represents a time of year when the resource is generally "Out of Season". To accompany the table, the Maine Sea Grant Program has developed an online tool that can be used to identify and provide information on marine species harvested from the Gulf of Maine and sold, marketed, or traditionally consumed as "seafood" in Maine. The guide is intended to collate information on species regulated at federal, state, and local levels as a service to consumers of Maine seafood⁸.

The second table is Where can I purchase seafood products in Maine? Lists marine resources (alphabetically) by species and value added options and is searchable by county. This table can be used to cross reference the Who processes and adds value to Maine seafood? As it is referencing similar data/information in a slightly different way.

The third table is Who processes and adds value to Maine seafood? Lists marine resources (alphabetically) with further information about the businesses that sell process (including lobster) and/or add value and is searchable by county. The name, location, and contact information of each facility that has this specie is listed. This table can help a user if they want to purchase a certain type of seafood but do not know where to find it in Maine.

The fourth table is Who transports Maine seafood by truck? Lists companies primarily based in Maine, that pick-up, transport and deliver seafood products for a fee. There are many companies that transport seafood but do not provide this as a service. We have identified companies that offer transport as a service. The routes that they travel and the products that they carry are shown in order to accommodate potential buyers, sellers, and others who are interested in obtaining Maine seafood.

The fifth table Who in Maine is using cold storage or freezer space for seafood? Lists cold storage facilities and businesses in Maine that store Raw Seafood (refrigerated) and/or Ready to Eat Seafood storage (frozen). Although these businesses are licensed to store refrigerated and/or frozen seafood, not all of them provide this as a service to 3rd parties and many simply hold the license as required by law to satisfy their own cold storage needs. This information could be useful for the purchasing, selling, storage, and transfer of seafood. If a business wants to sell seafood but does not have the correct infrastructure to store it, once viewing the table, the contact information to different facilities is conveniently provided and a business could consider inquiring about storage space for lease.

⁷ <http://www.pfex.org/price-landing-tool/>

⁸ <http://www.seagrant.umaine.edu/maine-seafood-guide>

The sixth table is Who sources Gulf of Maine fish from the Portland Fish Exchange? Lists businesses that hold accounts at the Portland Fish Exchange and are eligible to bid and purchase fish at the Exchange.

The seventh (and last) table Who is farm raising Maine seafood? Lists Maine based aquaculture businesses and the seafood products they grow in Maine waters. The table indicates the business name, contact person, phone number and the primary species being cultivated. Many growers have permission to grow or experiment with more than one species and these are listed as well but commercial harvest is generally limited to Atlantic salmon, blue mussels, American oysters, different varieties of kelp and a few sites growing European oysters and quahogs. The list includes both commercial and recreational growers.

The link to this information can be accessed on CEI's website at www.ceimaine.org

*Help us keep this information up to date. We are able to edit the data to add or remove specific listings. If you notice that something is missing or inaccurate, please contact Hugh Cowperthwaite at hsc@ceimaine.org or 535-2920.

Marine Resource Landings (Maine, relative to other top producing states)

According to the National Oceanic and Atmospheric Administration (NOAA), in 2012 Maine ranked 3rd in the top 5 states by value of landings.

- 1. Alaska (\$1.7 billion)
- 2. Massachusetts (\$618.2 million)
- 3. Maine (\$448.5 million)
- 4. Louisiana (\$356.6 million)
- 5. Washington (\$302 million)
- Maine leads the nation with lobster and soft shell clam landings⁹

Maine Marine Resource Landings Data

The Maine Department of Marine Resources (MDMR) annually quantifies the total number or weight of all marine species captured, brought to shore, and sold (or transferred) to another person or party. Seafood dealers (i.e. wholesale, retail, marine worm and elver) buying on a first-purchase basis (directly from harvesters) provide the landings information to the MDMR. Harvesters provide the catch data for some fisheries¹⁰. Below is a snapshot of the preliminary 2013 commercial Maine Landings by pounds as of 02/18/14¹¹. For up to date annual landings you can visit the MDMR website. <http://www.maine.gov/dmr/comfish.htm>

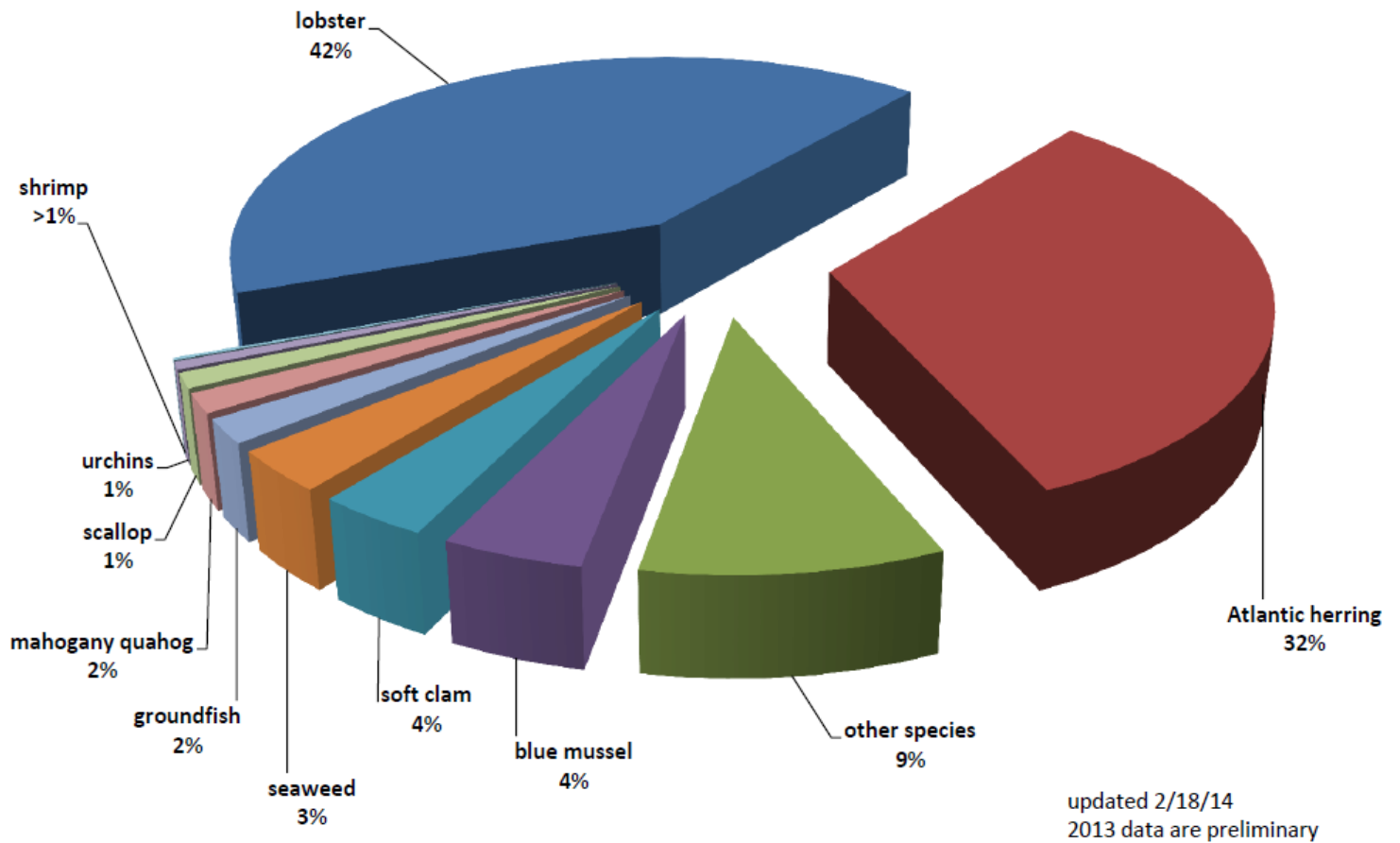
⁹ According to the NOAA Flyer. *Fisheries of the United States, 2012 A Statistical Snapshot of 2012 Fish Landings* www.nmfs.noaa.gov

¹⁰ <http://www.maine.gov/dmr/commercialfishing/landingsfaq.htm>

¹¹ <http://www.maine.gov/dmr/commercialfishing/documents/2013LivePoundsBySpecies.Pie.Graph.pdf>

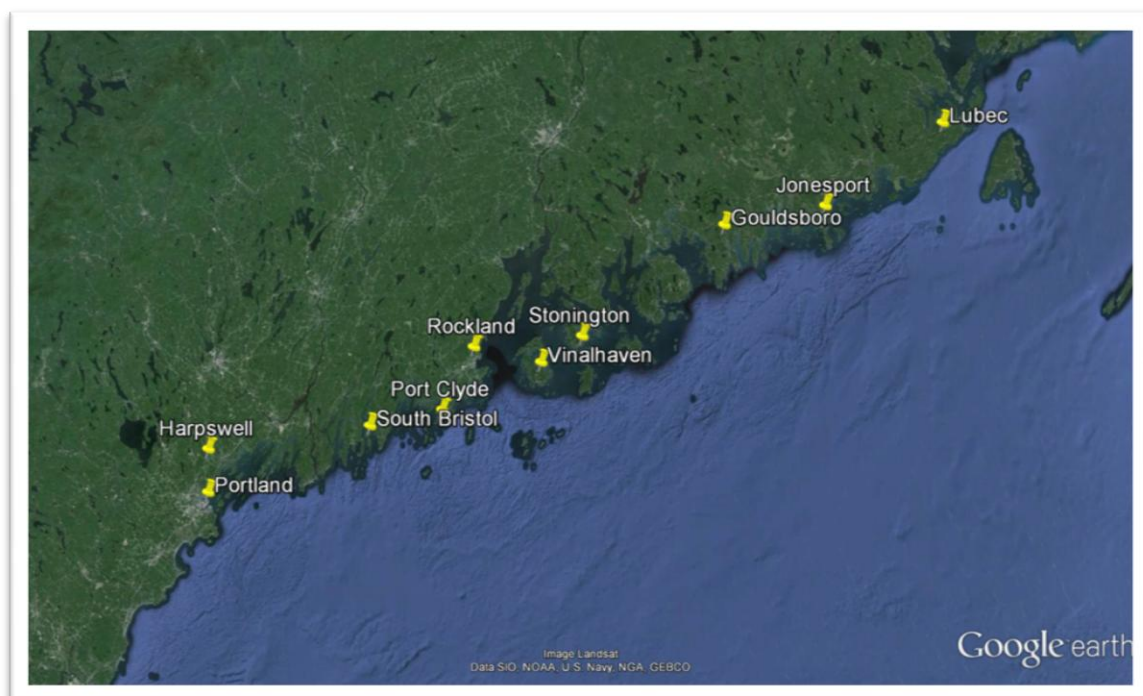
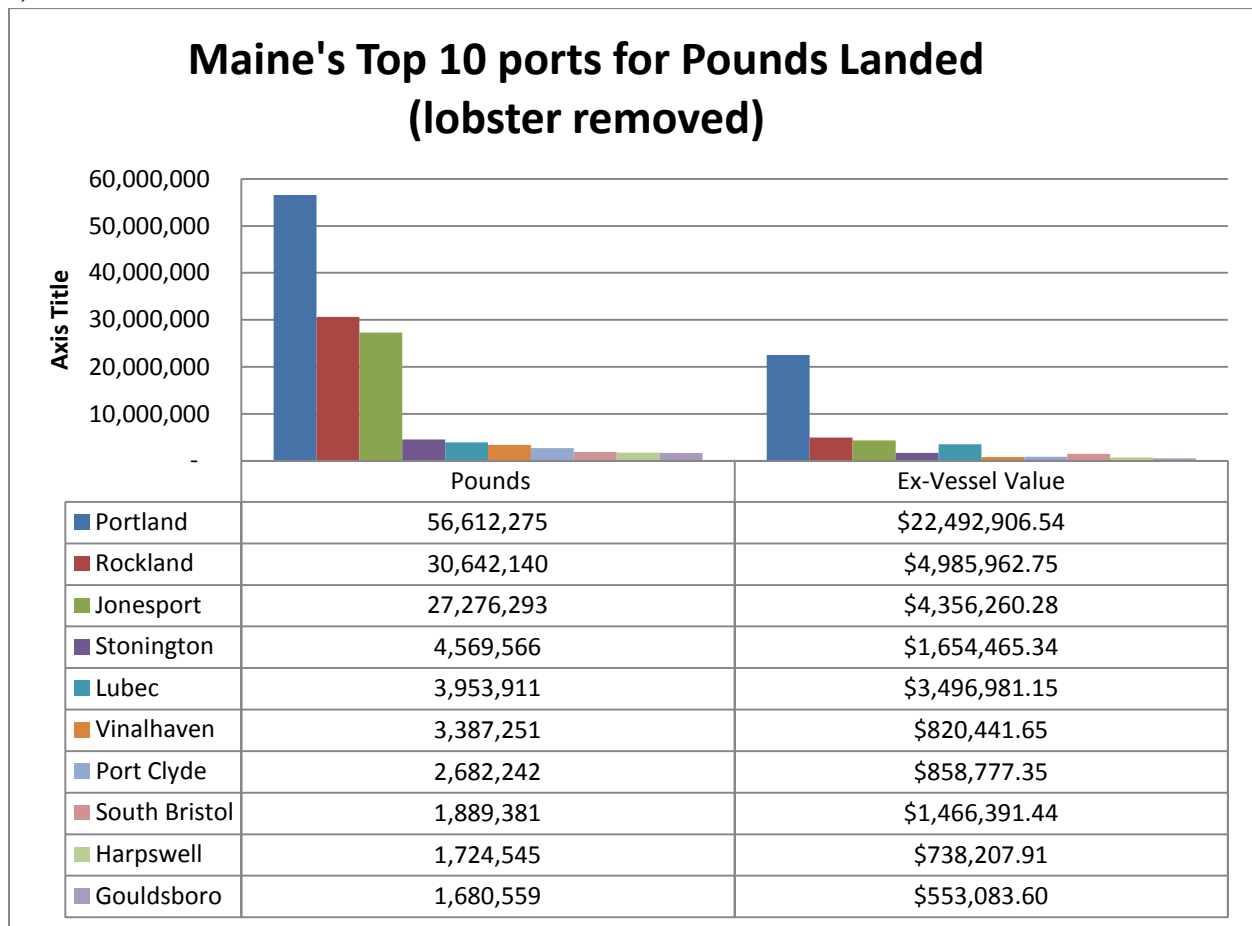
Preliminary 2013 Commercial Maine Landings By Live Pounds

Total: 302,607,782 as of 2/18/14



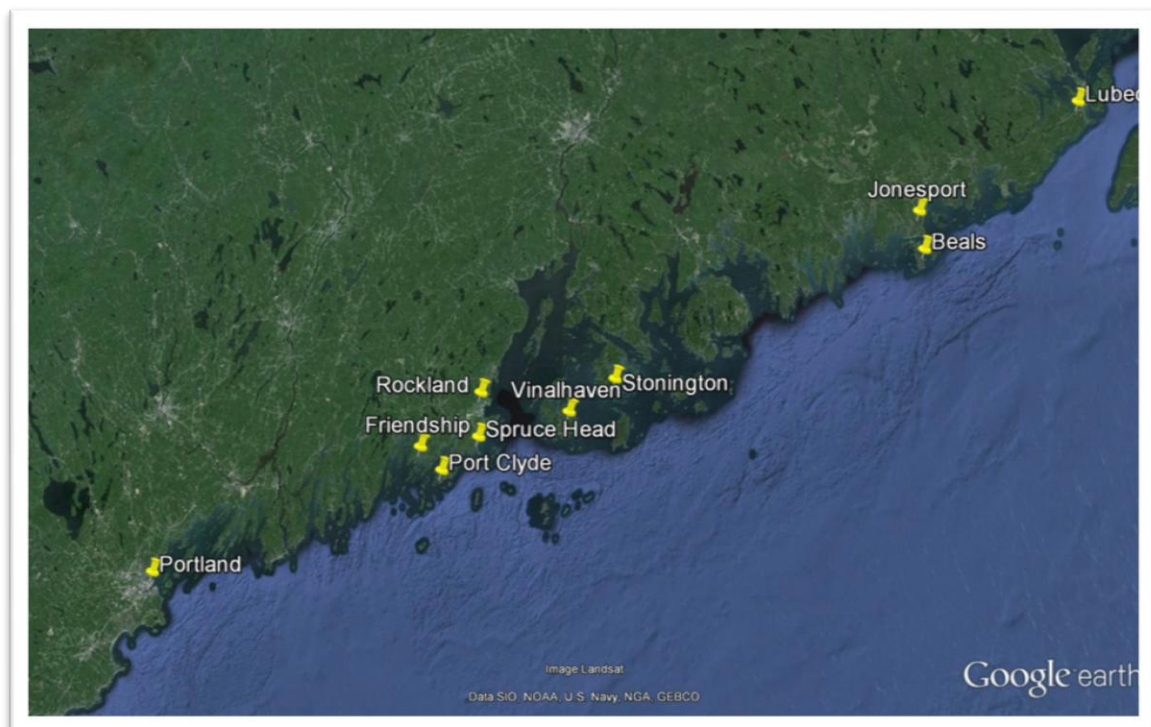
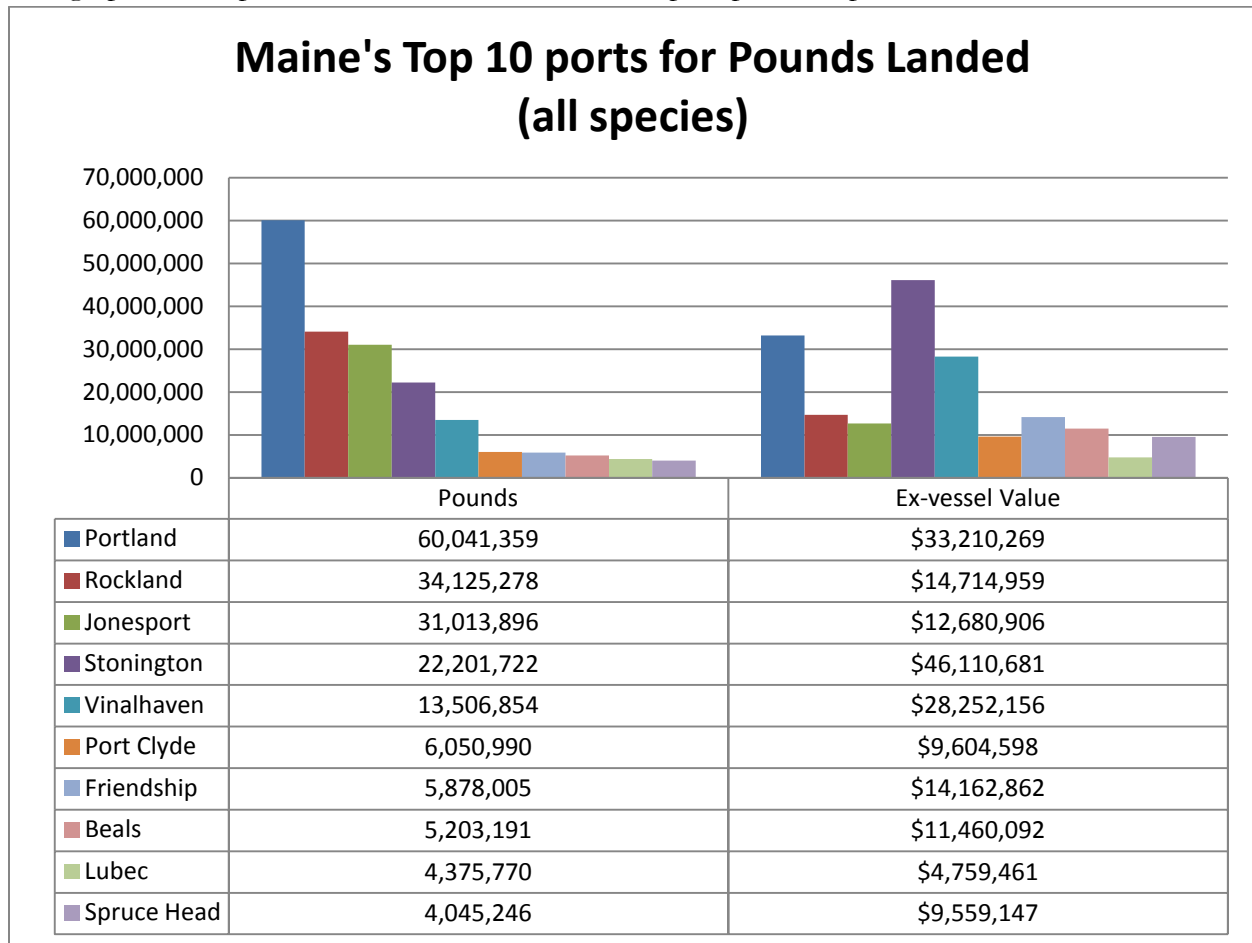
Maine's Top 10 ports for Pounds Landed (non-lobster)

Refer to the graph and map below which illustrate Maine's top 10 ports for pounds of seafood landed (with lobster removed).



Maine's Top 10 ports for Pounds Landed (all species)

Refer to the graph and map below which illustrate Maine's top 10 ports for pounds of all seafood landed.



Ice

Ice is a critical element to keep seafood cold, damp and maintain a constant unbroken cold chain. Refrigerated trucks have helped to alleviate some of the challenges associated with keeping a constant cold chain for seafood but refrigeration alone will dry out seafood products and by no means have cold transport trucks replaced the need for ice. The days of large ice making capacity machines in Maine for the fishing industry are over. In June 2013, a century old mainstay of the Rockland waterfront, O'Hara Corporation, ended its commercial ice-making operations for lack of demand by fisheries businesses. Vessel Services Inc. on the Portland waterfront does a fraction of the business it did in the past as many groundfish operations have left the state of Maine. SeaHag Seafood in Tenants Harbor now offers ice for sale to the fishing community. The facility has a new wharf which allows vessels to purchase ice dockside although most vessel operators in the Port Clyde fleet end up trucking ice to their boats. Vessel Services Inc. and SeaHag Seafood are the only remaining waterfront ice-makers of any capacity along the Maine coast. This has left an incredible gap in the ice service required by commercial fishermen (outside of Portland or Tenants Harbor) who must pick up ice in a pick-up truck. Since many of the larger ice machines closed, this created an immediate need for small businesses along the coast to make their own ice. As technology has advanced, ice machines have become more affordable, energy efficient and do not require a lot of space to house them. Now these businesses can make the ice they need, when they need it and not have to rely on a 3rd party. There are also different varieties of ice that are preferred by the fishing industry if available: block ice/crushed ice, flake ice, slush ice and chilled seawater to name a few. There is an interesting technical report entitled "The use of ice on small fishing vessels" that was put together for the Food and Agriculture Organization of the United Nations that goes into much more detail about ice¹². For more about cold chain logistics, a great resource can be found at "The Geography of Transport Systems" by Dr. Jean-Paul Rodrigue and Dr. Theo Notteboom¹³.

Bagged Ice

There are a number of businesses in Maine that make and sell bagged ice (although not necessarily specifically for use by the fishing industry). If a business is using water from a drilled well, they are required to conduct an annual water test that is submitted to the Maine Department of Agriculture, Conservation and Forestry, Division Quality Assurance & Regulations. After reviewing a list of twenty seven businesses that are licensed by the Division Quality Assurance & Regulations to sell "packaged ice" in Maine we came to the conclusion that many of these businesses are not near the coast and "packaged ice" is certainly an inefficient and cost prohibitive way to purchase ice for the needs of the commercial fishing industry. If a business is using water from a Public Water Supply (PWS) to make ice, the PWS is licensed by the Maine Drinking Water Program and the water supply is tested regularly by the PWS and not any one private business. Therefore businesses making ice from a PWS are not licensed or regulated by the Division Quality Assurance & Regulations. This makes it difficult to track them down and as a result, there is no complete list of businesses that make and sell ice specifically to the fishing industry.

Cold Storage Warehousing

When we reference cold storage warehousing we are referring to refrigerated warehouses, refrigerated facilities and cold storage warehouses all in the same manner. The U.S. Department of Agriculture National Agricultural Statistics Service's (NASS) conducts a biennial survey to determine the capacity of refrigerated warehouses nationwide. In the last survey (2013) Maine had a reported seventeen cold storage facilities, New Hampshire had three and Massachusetts had fifty three¹⁴. NASS adheres to a strict confidentiality pledge and personal identifiable information of survey respondents is not shared or made available to the public. It is also not mandatory for business owners to respond to the survey so the information collected is based on a much smaller sample size of

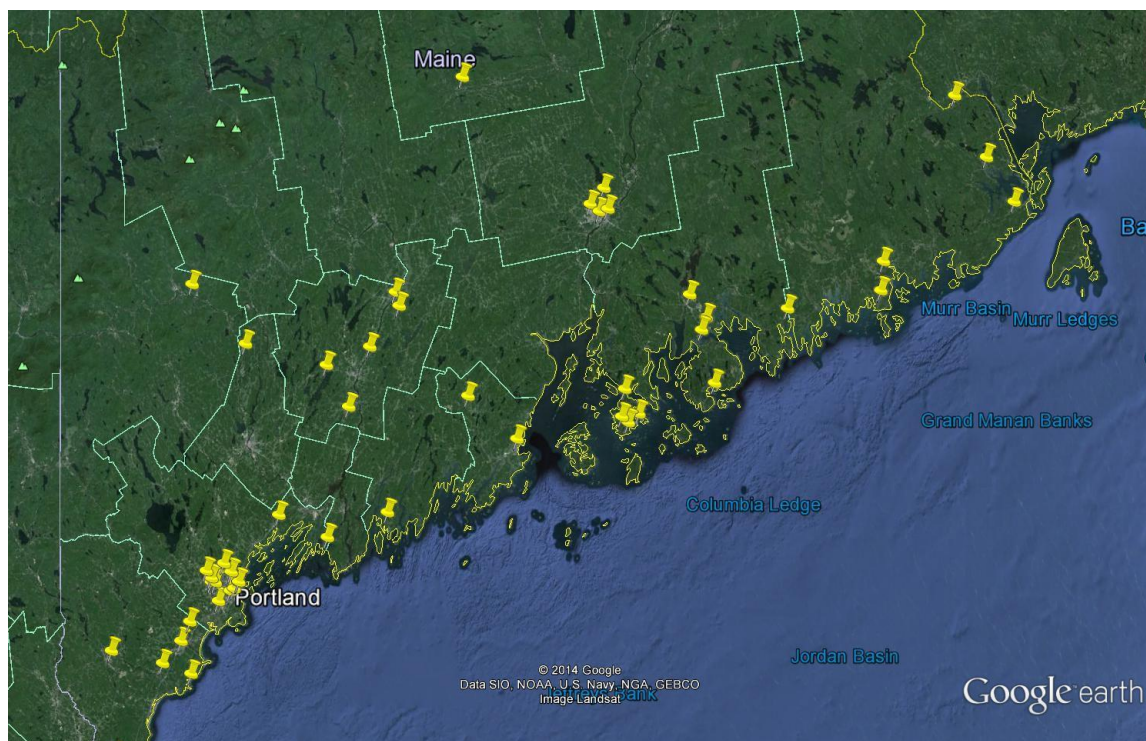
¹² <http://www.fao.org/docrep/006/y5013e/y5013e00.htm>

¹³ <http://people.hofstra.edu/geotrans/eng/ch5en/appl5en/ch5a5en.html>

¹⁴ http://www.nass.usda.gov/Publications/Todays_Reports/reports/rfwh0114.pdf

facilities that are in operation. Ultimately we were not able to identify the seventeen facilities in Maine (two were listed as public and fifteen were private) because of confidentiality.

We were able to secure a list of fifty-seven businesses in Maine that are licensed by the Maine Department of Agriculture, Conservation and Forestry, Division of Quality Assurance & Regulations to store “Raw Seafood Products” and/or “Ready to Eat Seafood Products”. Although these businesses are licensed to store refrigerated and/or frozen seafood, not all of them provide this as a service to a 3rd party and many simply hold the license as required by law to satisfy their own cold storage needs. These freezer and refrigerated facilities are a subset of a larger group of licensed “Food Storage Warehouses”¹⁵. According to the Food storage warehouse regulations a "Food storage warehouse" means any building, establishment or place where food is stored as a commercial venture or business, or is stored in connection with or as a part of a business. Notwithstanding the foregoing, "food storage warehouse" does not include a storage facility for one kind of native produce such as an apple warehouse, potato warehouse, or carrot warehouse; a warehouse which is part of a "beverage plant" as defined in 32 MRSA §1751; a person's home or dwelling; or an eating establishment as defined in 22 MRSA §2491.7.¹⁶ We have included this list of facilities in CEI's online resource under the section Who in Maine is using cold storage or freezer space for seafood? The map below shows the geographic distribution of Cold Storage Warehouse facilities in Maine.



In State Cold Storage Warehousing

Americold is currently the only large cold storage facility in the Greater Portland area and is located at 165 Read Street. They offer 1.7 million cubic feet of storage area, 150,000 square feet and access via 11 truck doors. Their services include: Temperature Controlled Warehousing, Export Services, Inventory Management, Labeling/ Pre-Ticketing, Manufacturing Support, Pick and Pack & Value Added Services. They also offer Integrated Cross-Dock Operations to Regional and National LTL Consolidation Program, Turnkey Transportation Management Outsourcing, Truckload Brokerage and Asset Based Shuttle Programs¹⁷. Americold operates 183 temperature controlled warehouses around the world.

¹⁵ Email communication with Michelle Newbegin, Division Quality Assurance & Regulations, Maine Department of Agriculture, Conservation and Forestry.

¹⁶ http://www.maine.gov/dacf/qar/laws_and_rules/food_laws_rules.shtml

¹⁷ <http://www.americold.com/facilities.aspx>

Galt Block Warehouse Company, Inc. in Bangor offers freezer storage and refrigerated warehousing storage. According to their website, they offer: 376,500 sq. ft. multi-temperature freezer storage, 24 hour central station monitoring for security, sprinklers, and warehousing refrigeration systems. TL/LTL highway transport services (fresh/frozen/dry). Ideally located for Northeastern U.S. and Atlantic Canada distribution, interline and transfer operations. Import/Export container drayage services to and from all major east coast U.S. and Canadian ports. Tenant space for distribution, processing, assembly, packaging and offices available. Rack and tote storage as well. "State of the Art" -15 degrees F import/export freezer storage facility. USDA, FDA (#19183731612) and HACCP compliant. State of the art refrigerated warehousing storage. Cross-docking and transloading pooled and consolidated shipping, freight arrangements, import/export services, container loading and unloading. Rail car loading/unloading, international air charter and break-bulk ocean transport services available.¹⁸

Central Maine Cold Storage in Bucksport is a relatively new business that offers both individually quick frozen (IQF) and blast freezing capacity along with cold storage space for the products they freeze. They store and direct ship lobster, shrimp, scallops and other seafood products.

Out of State Cold Storage Warehousing

Many seafood processors in Maine currently use out of state cold storage facilities because they offer large storage capacity for holding a large amount of inventory. Currently Boston is the major destination for aggregate refrigerated or frozen space for Maine seafood rather than Portland. The Portland Fish Exchange does offer short and long term seafood warehousing. The facility is temperature controlled at 37 degrees F and is a HACCP approved seafood facility. This however is not sufficient to serve the needs of the frozen seafood industry which requires deep freeze temperatures of -20 to -30 degrees to preserve products. Maine's current capacity to handle a sudden increase in seafood imports that need immediate cold storage is limited. The city of Portland is currently considering building a bulk freezer storage facility at the west end of the Portland waterfront. A portside cold storage facility could increase the competitiveness of Portland over other areas as currently a lot of the frozen fish coming into Portland is transported to Boston facilities for storage. Everett, Massachusetts is currently home to the only cold storage warehouse in New England that has direct access to rail without having to load cargo onto a truck. The Everett facility offers both inbound and outbound truck and rail access¹⁹. Worth noting are two facilities in Londonderry, NH. Londonderry Freezer Warehouse offers cold storage both near the Manchester airport and ~1 hour drive from Boston²⁰.

Mobile/Temporary Cold Storage

Some seafood businesses opt to rent a mobile or temporary cold storage (refrigerator or freezer) rather than constructing a permanent cold storage space. The National Portable Storage Association maintains a website where a user can search for companies that provide various portable storage containers, trailers, mobile offices, shipping containers, cargo containers, units, boxes, chassis and more. The search tool allows a user to search specific regions of the country to narrow the search.²¹ One such company is Polar Leasing which operates the largest all-electric fleet of temporary refrigeration in the country. Their units range from 6 x 8' trailers up to 8 x 20' walk in coolers. Polar Leasing offers more than 50 distribution depots with the closest facility to Maine located in Upton, Massachusetts. Their website includes a calculator to help estimate the costs of renting a unit for a few days or a few years²²

¹⁸ http://www.galtblockwarehouse.com/warehouse/freezer_storage.html

¹⁹ <http://www.scribd.com/doc/130437417/Mainely-Ag-Mar-2013-Small>

²⁰ <http://www.reallycold.com/index.htm>

²¹ http://www.npsa-us.org/index.php?s=public_search

²² <http://www.polarleasing.com/states/maine.aspx>

Transportation of Seafood

Fifteen years ago Northeast Transport Inc. a midcoast based refrigerated commercial carrier, moved seafood directly to Portland, Boston, New York, and Philadelphia six days a week in multiple daily trips. The gradual disappearance of the groundfish resource altered the approach to their business. In 2013 the company sent seafood on one truck per day, four days per week to Boston²³. In the spring of 2014 they announced the suspension of refrigerated service to Boston. Specialized seafood companies that must transport their products to Boston are cobbling together cooperative agreements to run privately owned trucks on an irregular basis. Seafood sellers must now find and integrate their requirements with these types of informal agreements. Transportation is a real problem with some of the smaller ports in Maine that still land groundfish. Without a significant volume of fish to transport it becomes inefficient and this in turn hampers innovation in the industry.

Having noted a decline in fisheries products needing transport to markets, there are still many companies transporting Maine seafood in and out of the state. Some businesses (seafood buyers) have their own trucks and others hire (contract) their trucking needs. Our intention was to identify some of the major seafood transportation companies operating in Maine that transport seafood products for a fee (for hire). Having said that, there are a number of companies who own their own trucks and may also be available for hire. Surprisingly many of the trucking companies do not have websites and as a result our findings have been discovered primarily by word of mouth. Some of the larger carriers include: AC Inc., Crown of Maine, D.C. Air, Galway Bay Transport, Northeast Transport and RC Moore. Details and contact information on these businesses can be found in the Who transports Maine seafood by Truck? section of CEI's online resource.

Transfer Depots

The Portland Fish Exchange serves as an intermodal facility in Maine where seafood products can be dropped off for cross shipping. Given Boston's central proximity to other New England states it is not surprising that Boston is the major hub for intermodal refrigerated transportation of seafood products in the northeast. Boston is home to two major third party handlers of seafood products, Araho Transfer²⁴ and Peninsula Of Boston Inc.²⁵ Araho Transfer offers: cold storage, repacking, local transport and is a hub of nearly 30 seafood carriers with regularly scheduled routes (primarily along the eastern seaboard). Of the nearly 30 carriers, there are currently three carriers making regular trips between the Portland Fish Exchange and Araho Transfer. They include: Fry Trucking, Galway Bay Transport, and Wade²⁶. Peninsula Of Boston Inc. offers similar services and currently lists three carriers making regular trips between their facility and Maine. These include: Fry Trucking, Galway Bay Transport and Hannaford²⁷.

Federal Express (FedEx) and United Parcel Service (UPS)

Packaged seafood originating from many locations in coastal Maine may be shipped through FedEx and UPS using the least expensive ground delivery service. Most destinations within the New England states and parts of downstate eastern New York are designated for one day Ground Service delivery if the origination location is located within Maine's southern or central coastal areas.

With FedEx for example, packages originating in eastern Maine, e.g. Eastport to Belfast, will deliver ground service in one day only within Maine, and not to the rest of New England. The dividing line for an origination location that determines one or two days in transit for Ground Service seems to fall between Camden and Lincolnville on the eastern side of Penobscot Bay. Packages originating in coastal towns to the north and east of this location may not reach their New England locations in one day with Ground Service. Package originations to the south and west of this line benefit from one day delivery via Ground Service to all of New England.

²³ (Personal communication with owner Jeff Payson).

²⁴ <http://www.arahotransfer.com/>

²⁵ <http://www.peninsulaofboston.com/index.html>

²⁶ <http://www.arahotransfer.com/pdfs/Carrier.pdf>

²⁷ http://www.peninsulaofboston.com/new_schedule.html

In the UPS system, one day Ground Service delivery to most of New England occurs from all origination points to the west of Jonesboro in Washington County. Jonesboro and points east have a two day delivery time for Ground Service. *UPS seems to offer advantages over FedEx in delivery speed by ground service for towns in Waldo County, Hancock County, and eastern Washington County.*

Both companies charge a shipping rate and pick-up fee in a combined bill. The pick-up fees may be as low as \$10/visit for regular high volume shippers or a higher pick-up fee of \$11-22 depending on the shipping volumes and frequency of shipments. Consolidating multiple packages for shipment will lower the pick-up fee on a per pound basis.

The FedEx Ground Service calculator map link accepts the ZIP code of origin and responds with a map of one day, two day, and multiple day delivery areas which correspond to the origination location.

<http://www.fedex.com/grd/maps/ShowMapEntry.do>

UPS delivery maps for Ground Service zones may be accessed using ZIP codes through:

www.ups.com/maps

FedEx Ground Service

Delivery times: 1-5 days within the contiguous US states.

Service days: Monday through Friday, delivery by the end of the business day.

Package size and weight: Up to 150 pounds, 108" in length, maximum length plus girth is 165".

Rates: May be estimated using the FedEx rate finder at www.fedex.com/ratefinder/home.

Options: Allows customers to be invoiced for inbound shipments controlling costs and avoiding suppliers' charges.

Exceptions: Cannot deliver to P.O. Boxes, exceptions to policies in remote Alaskan and Hawaiian locations.

Quick FedEx Ground price estimates vary with point of origin and destination. In the example below Rockland, Maine to Bridgeport, Connecticut was chosen for illustration of one possible route. The lowest price per pound did not correspond to the heaviest package, but to approximately 70 pounds in a package. In most cases the cost per net pound of seafood will be between \$.55 and .80 per pound delivered anywhere in New England from most locations in Maine. Contract pricing with FedEx may lower that cost significantly if the shipper can deliver enough volume to warrant a discount.

FedEx Ground Rates (business delivery), single package, one day delivery, Rockland ME to Bridgeport CT (2013)															
Weight (lbs.)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Ground rate \$	11.06	14.69	18.90	22.97	26.12	28.42	32.29	49.38	58.96	68.48	78.00	85.85	93.37	101.84	110.75
Price/lb. \$	1.10	0.73	0.63	0.57	0.52	0.47	0.46	0.54	0.65	0.68	0.70	0.71	0.71	0.72	0.73

The more remote eastern Maine locations may not benefit from the one day delivery using relatively inexpensive ground service. An alternative strategy can be imagined whether for FedEx or UPS. If seafood trucks originating in eastern Maine can deliver packages to FedEx centers prior to their cut off times, and those shipping centers are located in eligible departure areas (by ZIP Code) for one day ground shipments, then the twice handled package may move in one day for a combined cost of the FedEx Ground rate plus a short delivery surcharge of the first handler, probably not more than an extra \$.10 per pound.

FedEx Ground Multiweight Bulk Shipments

Description: multiple-package shipments weighing 200 lbs. or more moving as one unit to the same destination on the same day. Pricing is based on the combined weight of the packages.

Delivery times: 1-5 days within the contiguous US states

Package size and weight: Multiple piece shipments with a total weight of 200 pounds or more. Each package may weigh up to 150 pounds, 108" in length, maximum length plus girth is 165".

Additional information: Shrink wrapping or palletizing shipments is not required. Contract pricing is required. Contact FedEx representative.

Contract pricing is volume dependent on a customer by customer basis. FedEx account representatives will work with a client to establish a rate which may vary from as little as a 10% reduction of the published rates to as much as a 55% reduction²⁸. As volume goes up, shipping costs (per pound) decline.

UPS Ground Service

All information about UPS Ground service may be access through the following link:

<http://www.ups.com/content/us/en/shipping/time/service/ground.html>

Delivery times: 1-5 days. Service extends throughout 50 states and Puerto Rico.

Service days: Monday through Friday, delivery by the end of the business day.

Package size and weight: Up to 150 pounds, 108" in length, 165" length plus girth maximum

Rates: May be estimated using the following link,

www.ups.com/content/us/en/shipping/cost/zones/continental_us.html#Step+1%3A+Determine+Your+Zone+for+Shipping+Within+the+U.S.+and+to+Puerto+Rico

Retail (no contract) UPS Ground Rates, single package, one day delivery, Rockland ME to Bridgeport CT (2013)															
Weight (lbs.)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Ground rate \$	11.89	15.79	20.31	24.68	28.06	30.54	34.69	43.93	54.21	64.44	74.66	83.10	91.18	100.27	109.85
Price/lb. \$	1.18	0.78	0.67	0.61	0.56	0.50	0.49	0.54	0.60	0.64	0.67	0.69	0.70	0.71	0.73

Retail rates for UPS Ground are similar to the published FedEx Ground Rates. Only pennies per pound separate the two. In contrast UPS does publish its standard rates that require a contract with the shipper and assume frequent pick-ups at the place of business. These rates are likely similar to FedEx's unpublished contract rates learned only from a conversation with a customer service representative of the company. The following table comparatively illustrates the contract UPS Ground Service rates for the same points of origin and delivery.

Standard (w contract) UPS Ground Rates, single package, one day delivery, Rockland ME to Bridgeport CT (2014)															
Weight (lbs.)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
Ground rate \$	8.75	11.46	14.40	17.26	19.47	20.98	24.32	29.67	36.60	43.50	50.41	56.26	61.55	67.70	74.17
Price/lb. \$	0.87	0.57	0.48	0.43	0.38	0.34	0.34	0.37	0.40	0.43	0.45	0.46	0.47	0.48	0.49

With the published contract prices in effect, the net cost per pound for UPS in this example of a one box shipment would likely fall between \$0.40 -.60 per pound, about 31% lower than the retail (no contract) costs per pound of packages of similar weight. Customers who ship high volumes may benefit with additional discounts lower than the Standard UPS Ground rates. However, UPS was reticent to share specific discount percentages tied to volume for this study and consider that information proprietary²⁹.

FedEx offers slightly better published rates while UPS has better integrated Ground Service and one day delivery for points of origins in eastern Maine. Both companies consider parts of Washington County too remote a point of origin to support one day delivery to any destinations outside of Maine's borders.

While refrigerated seafood transport carries Maine seafood via Routes 1 and 95 to Portland and Boston for under \$0.15/pound, the transfer to trucks headed directly to the New England food hub locations is problematic. There may be no existing commercial refrigerated service to these scattered locations. So even if the Maine coast to Portland/Boston leg is more affordable, the lack of options for the delivery leg defeats this model. Some food hubs may send regular trucks to Boston and therefore may arrange backhauls of Maine seafood using their own trucks. But permitting requirements and divergent cold chain requirements for both land and sea products continues to be a barrier for co-distribution of food.

²⁸ Personal communication with a FedEx customer representative, 11/25/13

²⁹ Communication with UPS Customer Representative, 11/26/13

The advantages of shipping directly from the supplier to the end user using FedEx or UPS Ground are the quick door to door delivery, the attention to small packages, convenience and freshness. Traditional seafood carriers stick to traditional north/south routes either headed for Portland or Boston in most instances. FedEx Ground Service and UPS Ground options may be practical alternative ways to transport Maine seafood to scattered regional destinations away from the Portland/Boston market areas.

Air Freight

Air Freight is an area that is above and beyond the scope of this study. There are a number of commercial airlines offering transport/shipping services for seafood products.

Eimskip, Container Transport in the North Atlantic

Eimskip is a privately held company headquartered in Reykjavík, Iceland. Founded in 1914 they have become a leading transportation company in the North Atlantic and provide an extensive worldwide network of refrigerated logistics services. With Eimskip's new service to Portland every other week, Maine now has connections with Newfoundland, Iceland, Norway, Faroe Island, Scotland and mainland Europe. One of their key services is to serve the seafood industry by way of establishing offices (worldwide), terminals, cold storage and warehouse facilities, unloading fishing vessels and storing the catch, loading containers onto refrigerated vessels and distributing the cargo worldwide. 70% of the perishable products currently being carried by Eimskip are seafood. The remaining 30% are fruit, vegetables and other perishable related products. The company takes great care to extend the shelf life of fish products by careful handling and providing an uninterrupted cold chain during the transport. Further R&D efforts are being made to extend the shelf life of fresh fish even further with super chilling and product packaging. In regards to fruits and vegetables, great care and effort is taken to provide customers with information about the current location of their products, temperature monitoring, humidity, motion, the release of carbon dioxide and ethylene which can deteriorate product quality and freshness³⁰.

Import/Export

Eimskip offers a shipping product called "eBox" which is a service for smaller shipments exported from North America and Europe to Iceland. On the Eimskip website www.ebox.is a customer can calculate the anticipated price to transport their goods. Maine lobster for example can be shipped by the pallet and is not dependent of a full container order. Currently Eimskip carries dry, fresh, salted and frozen seafood products in full container and partial container loads. Since landing in Portland in March of 2013, an estimated 35% of the imports coming into Maine are frozen seafood products³¹ including: cod and haddock (from Norway & Russia) and redfish to name a few.

Portland, Maine a regional seafood hub of the Northeast

Eimskip chose Portland because it offers a modern terminal facility with the infrastructure in place (warehousing, distribution, cross docking) to start landing. The facility is easily accessible to Maine's transportation systems including: roads (I-95, I-295), the Portland International Jetport and plans are underway to extend rail service to the International Marine Terminal Facility. Eimskip is currently moving about 5,000 40-foot containers a year. Future plans include increasing the frequency of vessels coming to Portland and the volume of containers. Their influence on future seafood imports and exports could be very large.

³⁰ Eimskip, Cool Choice in Logistics, 100 Years of Shipping, 2014

³¹ <http://www.mainebiz.biz/article/20130415/CURRENTEDITION/304119993/cold-storage-needed-to-boost-new-shipping-service>

Investing in Manufacturing Communities Partnership

In 2013 the Obama Administration created the “Investing in Manufacturing Communities Partnership” initiative to help accelerate a resurgence of manufacturing and create jobs across the country. In May of 2014 the Greater Portland area received a designation which offers priority consideration for \$1.3 billion in Federal grants from 11 Federal agencies to help implement a vision called the “Greater Portland Sustainable Food Production Cluster”. The goal of the effort is focused on creating a manufacturing (processing) hub around agriculture and seafood products. The Greater Portland Council of Governments is leading this project with many partners (including CEI) in the food and food processing industry.³²

Planned growth for the International Marine Terminal

Current plans are underway to significantly increase the size of the International Marine Terminal (shipping-container terminal) in Portland. The state of Maine is investing \$27 million into the facility. With Eimskip as a relatively new anchor tenant, the Maine Port Authority who leases and manages the property from the City of Portland is actively working to improve the facility. Planned improvements and anticipated benefits include:

- A long overdue revitalization of a part of Portland’s industrial waterfront that has been vacant for years
- Provide a direct link to rail service and the ability for vehicles to unload containers from ships and put them on trains within the same terminal
- Access for trucks to drop off and pick up containers
- Compete for business with other major ports along the East Coast and stay competitive
- Significantly lower the costs for commercial customers
- Eimskip could potentially decrease shipping rates for customers with improved speed, efficiency & volume
- Improve transport service for current customers
- Expand into new markets that have been cost prohibitive due to high transportation costs
- Attract new international and domestic cargo business to Maine³³

Rail Transport

The state of Maine owns rail tracks along the Portland waterfront (purchased from Pan Am Railways). Now that Eimskip is making regular visits to Portland’s waterfront, the state is in the process of extending their tracks an additional 1,500 feet to the east to reach the International Marine Terminal and will connect with Pan Am Railways to the west. This will offer a less expensive way to transfer cargo direct from a ship to rail car without having to involve a truck. There are 154 refrigerated container plugs (power sources) at the Portland site. This will help to keep the refrigerated containers cold after being unloaded and will allow Eimskip to unload the vessel as quickly as possible to minimize the time the vessel is in port.³⁴ Although Eimskip will help attract international business to Maine, the rail connection will also better connect Maine with markets in Midwestern states that are far enough away that makes traditional trucking cost prohibitive. Eimskip’s presence will also likely help promote Maine products as available regional resources to be aligned with other New England products.

Maine Lobster Record Landings

Despite record harvests of lobsters in Maine, lobster fishers are earning less with the lowest landed prices in decades. Constantly higher costs for bait and fuel have cut profits further. Many lobstermen are trying to “fish smarter” simply to stem the erosion of the profit margin. The lobster industry currently requires strong regional demand for live product and depends on the Canadian processing market for its economic health. Development of Maine-based processing facilities for lobster and advanced transport systems for live lobster will diversify the

³² <http://www.pressherald.com/2014/05/28/portland-wins-federal-manufacturing-designation-for-food-and-agriculture/>

³³ http://www.pressherald.com/news/Expansion_of_cargo_facility_in_Portland_a_giant_step_for_the_port.html?pagenum=full

³⁴ <http://www.mainebiz.biz/article/20130415/CURRENTEDITON/304119993/cold-storage-needed-to-boost-new-shipping-service>

market for lobster and increase demand blunting the full impact of lowered lobster prices and rising fuel and bait costs. In addition, expansion of refrigerated bait storage facilities will make lobstermen less vulnerable to swings in bait price, since frozen bait can be stockpiled when purchase prices are reasonable.

Trade Adjustment Assistance Program

In 2010 the Maine Lobstermen's Association filed a petition to the USDA for assistance through the Trade Adjustment Assistance (TAA) Program with a declaration that the Maine lobster resource (as a commodity) had been "negatively impacted" by foreign seafood imports in 2009. The petition was successful and as a result, all Maine lobstermen who landed lobster in 2009 became eligible recipients of in person and online workshops to help improve their businesses. Applicants who successfully completed 12 hours of training were then entitled to working one-on-one with a business counselor to write a business plan. Over a three year period nearly half of Maine's ~5,000+ lobstermen took advantage of the program and were also compensated financially for their efforts. Maine's lobster resource continues to be impacted by global markets and unpredictable price fluctuations which negatively impacts the bottom line of these small independent businesses which make up the majority of the fishing industry in Maine.

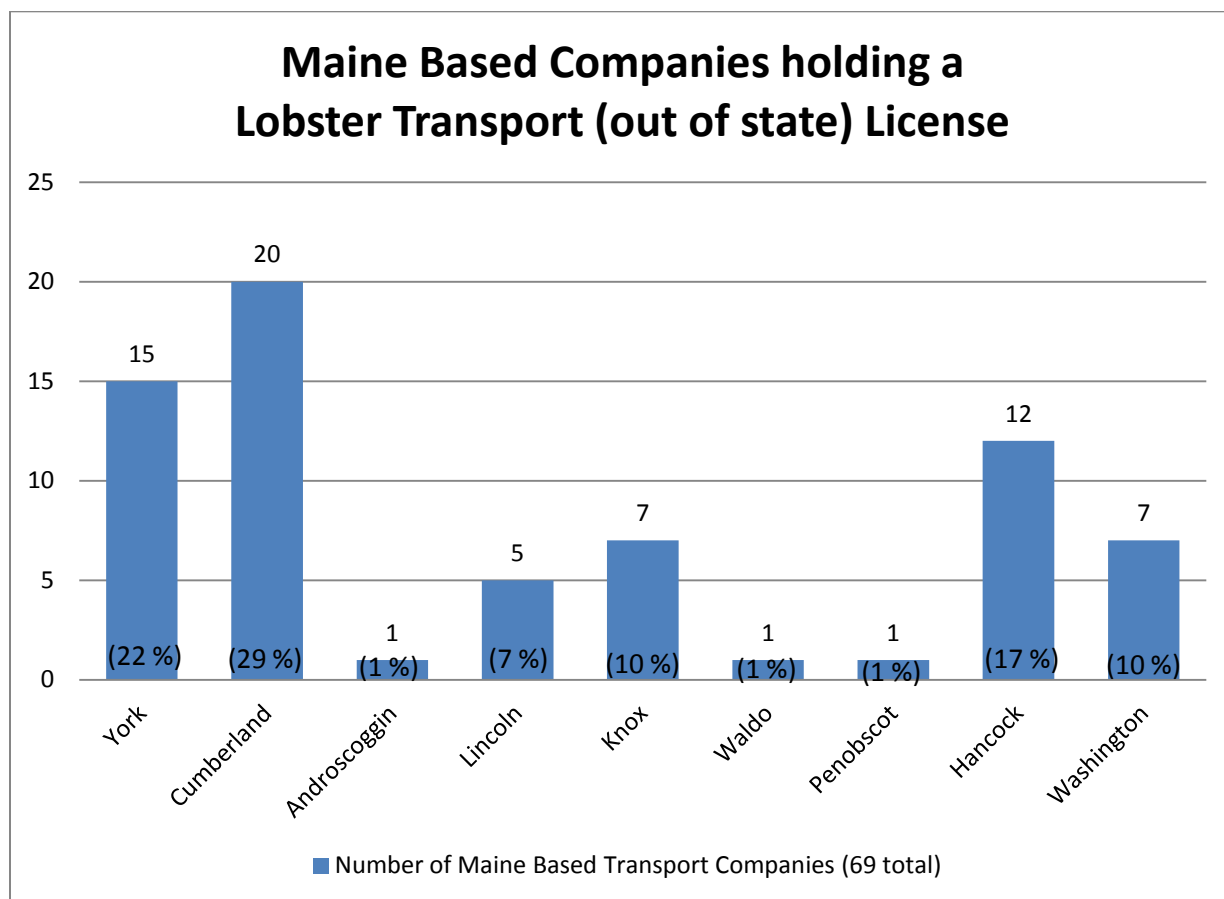
Maine Department of Marine Resources Lobster Transportation License

The holder of a lobster transportation license may buy from a licensed wholesale seafood dealer and transport beyond the state limits lobsters or their parts or meat. A license authorizes these activities with only one vehicle owned, leased or rented by the license holder. A supplemental license must be obtained for each additional vehicle. Each application must identify each vehicle or other mode of transportation to be used for transporting lobster³⁵.

³⁵ <http://www.mainelegislature.org/legis/statutes/12/title12ch625.pdf>

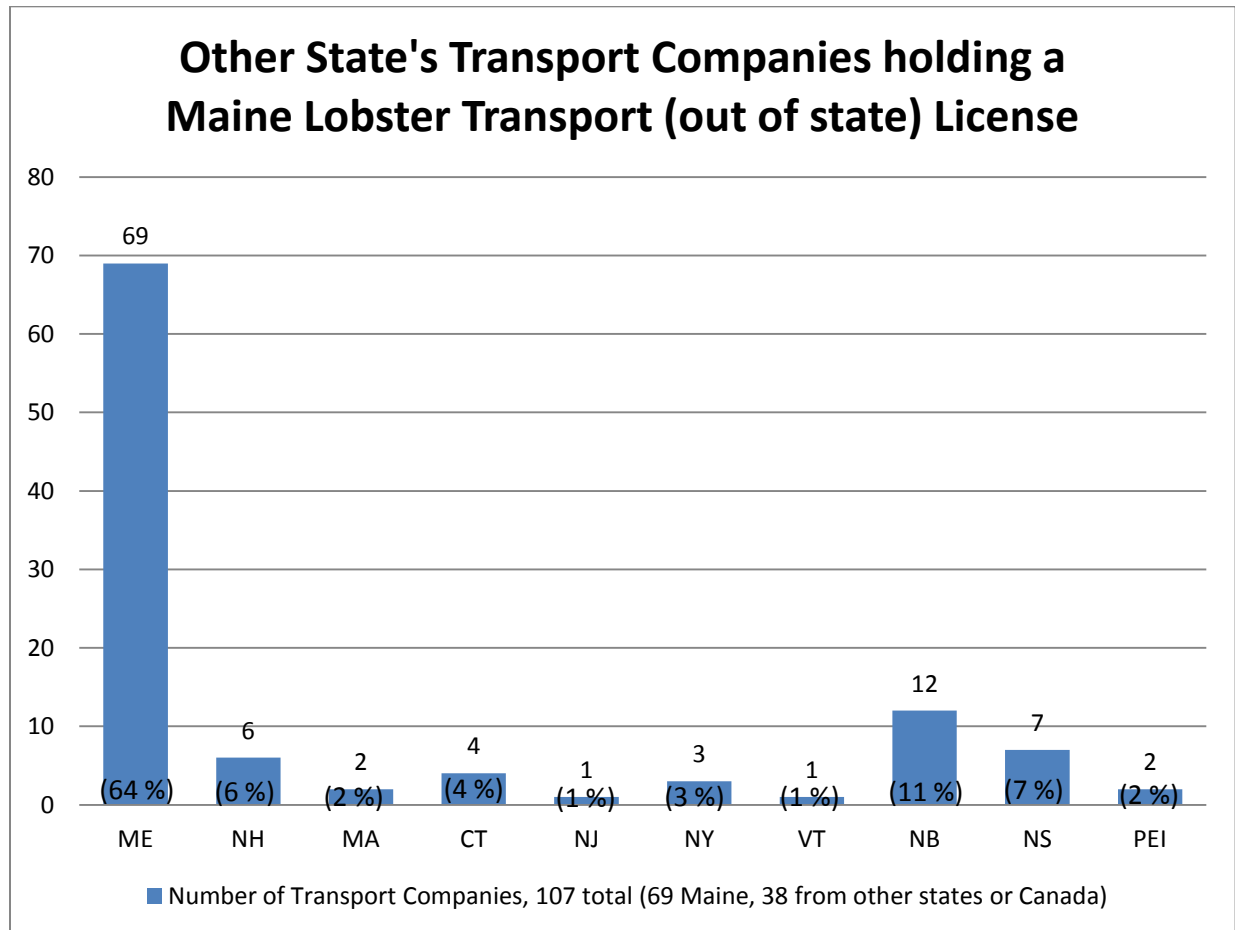
Maine Based Transportation Companies

The graph below illustrates the geographic distribution (by county) of Maine based companies licensed to transport lobster across state lines (out of state). Assuming that the county is the businesses (home base) there is a trend showing a cluster of businesses in the eastern and western ends of the Maine coast line. Companies that start their routes in the east presumably transport lobster westward along the Maine coast on Route 1 (with pick up's along the way) or Route 95 directly to Portland or Boston with no pick up's past Ellsworth, some move lobster directly to Canadian companies that transport to the north east into New Brunswick for processing. Companies that start in the west presumably transport lobster westward out of the state on Route 95 and to the north east into Canada for processing. Some companies have a single truck and others have a multiple truck fleet.



Other states and Canadian provinces transporting Maine lobster

The graph below illustrates the central business location of all companies licensed to transport Maine lobster across state lines (out of state). Worth noting is that there are a significant number of businesses that hold both lobster and shellfish transportation licenses indicating that many trucks (companies) transport both types of seafood.

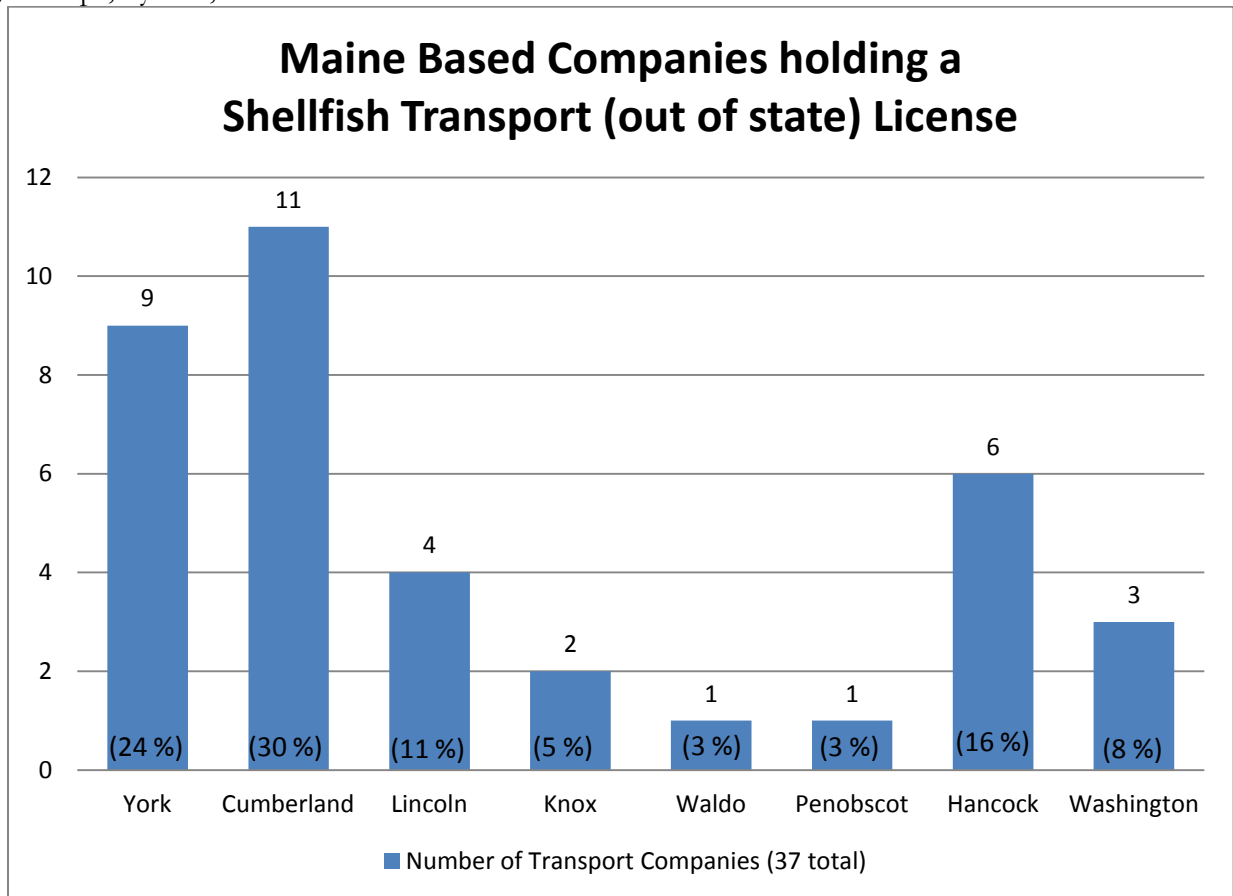


Maine Department of Marine Resources Shellfish Transportation License

The holder of a shellfish transportation license may buy certified shellfish and transport them beyond the state limits, to the extent these activities are expressly authorized by a shellfish certificate or its equivalent from another state. All shellfish transported under this license must be procured from a wholesale seafood licensee certified under section 6856. A license authorizes these activities with only one vehicle owned, leased or rented by the license holder. A supplemental license must be obtained for each additional vehicle. Each application must identify each vehicle or other mode of transportation to be used for transporting shellfish³⁶.

Maine Based Transportation Companies

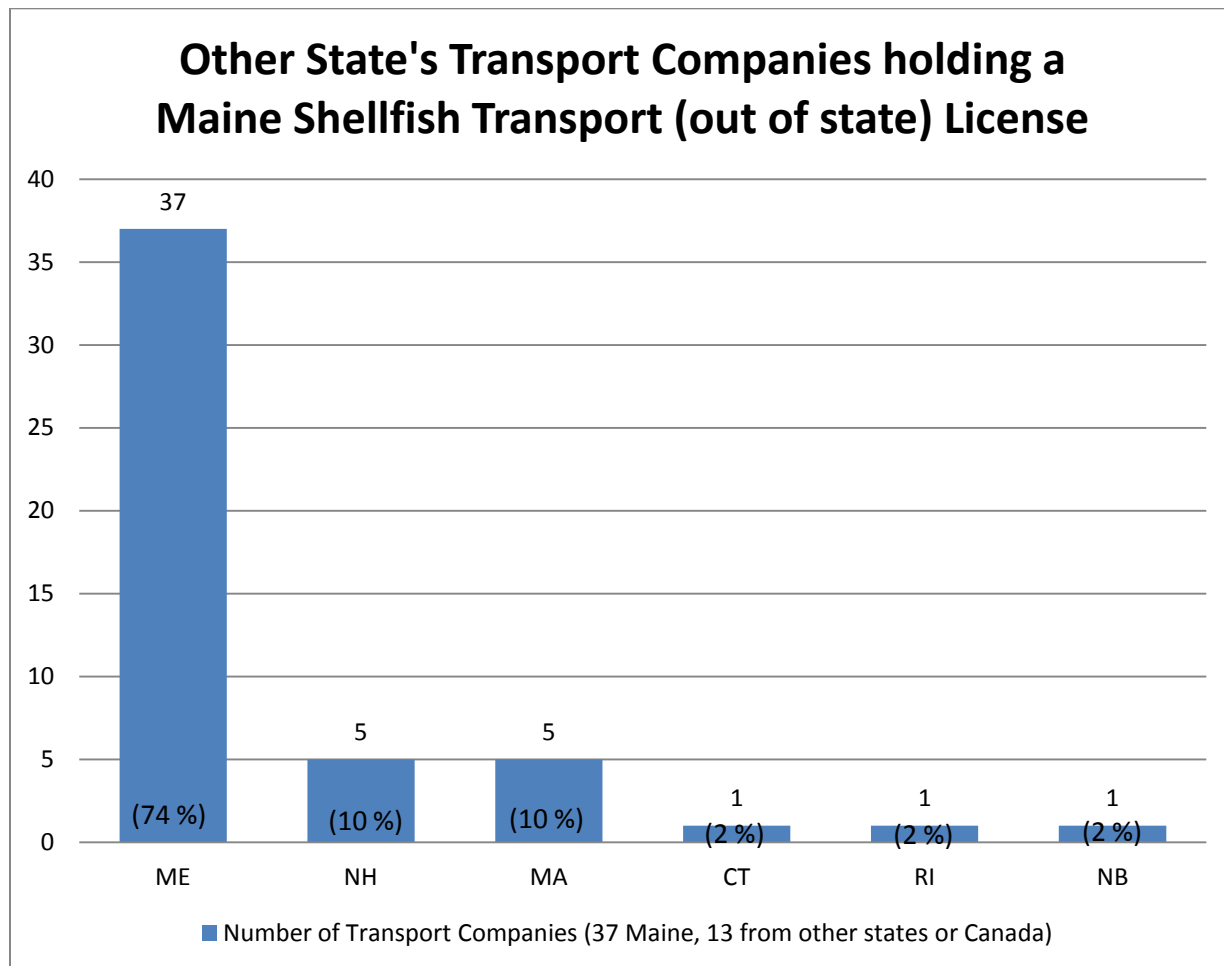
The graph below illustrates the geographic distribution (by county) of Maine based companies licensed to transport shellfish across state lines (out of state). Molluscan shellfish is presumed, e.g. soft shell clams, hard shell clams, mussels, scallops, oysters, etc.



³⁶ <http://www.mainelegislature.org/legis/statutes/12/title12ch625.pdf>

Other states and Canadian provinces transporting Maine Shellfish

The graph below illustrates the geographic distribution of all Maine based companies (cumulative) licensed to transport molluscan shellfish across state lines (out of state) with a comparison to other states and Canadian provinces transporting Maine shellfish across state/country lines. There are a few companies in New Hampshire and Massachusetts who are transporting shellfish out of Maine but the majority of the businesses are based in Maine.



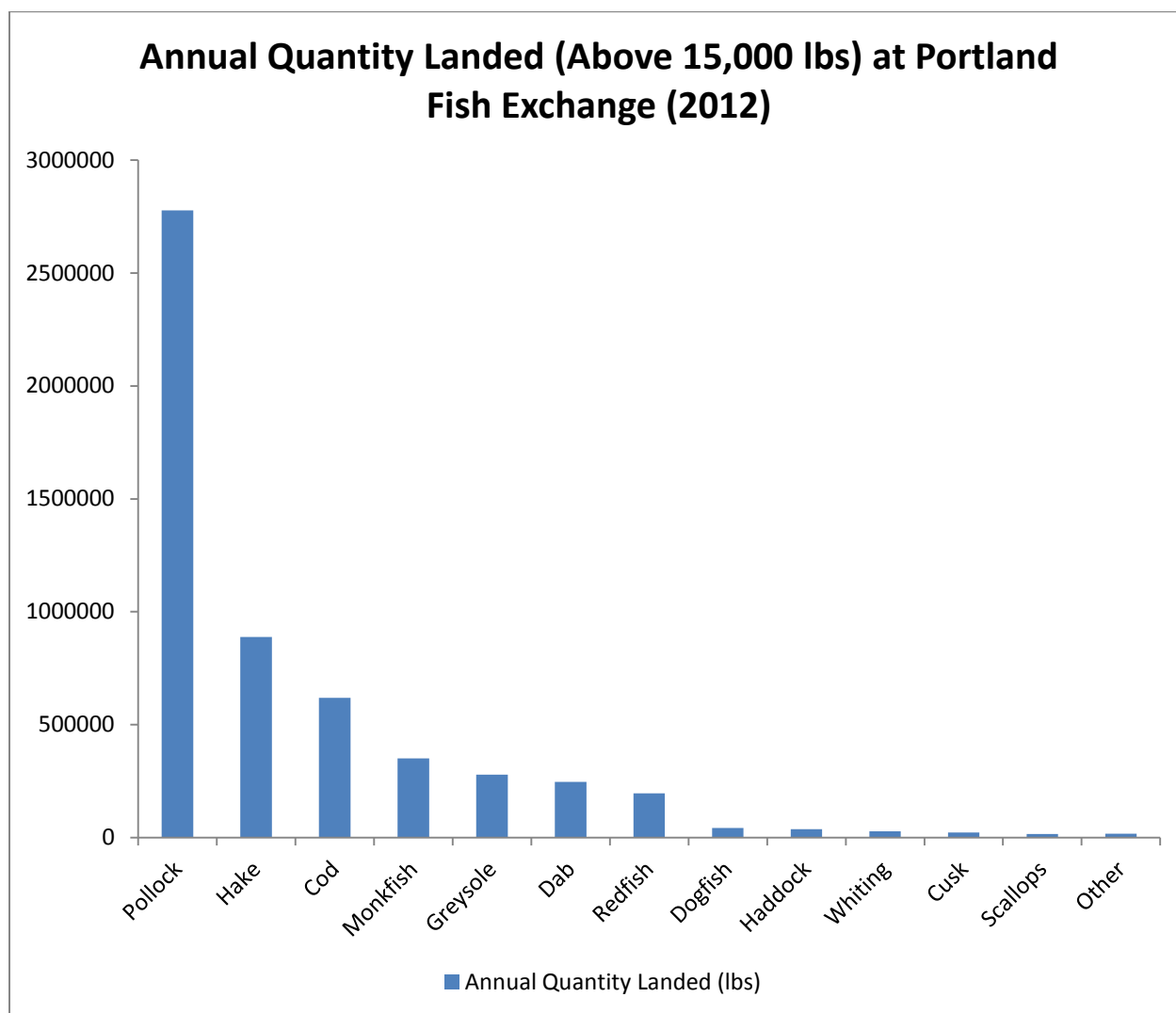
Maine Groundfish

Groundfishing is conducted by trawling (primarily offshore), gillnetting (primarily inshore) and hook/jig gear. The groundfish fleet has been hampered by a shrinking resource and adaptation to a new regulatory framework of assigned species allocations. Considerable economic impacts resulted from the adoption of “catch shares” groundfish regulations primarily due to a decline in fishermen’s allocation(s) to fish New England’s groundfish. The Maine fisheries fleet in 1990 included more than 300 trawlers. By 1996 that number had dropped to 188 boats. Because of a combination of regulatory constraints and access to the remaining resource, many of these boats have been sold or have moved south to Massachusetts ports leaving just 47 active fishing boats (2011 count) still landing groundfish in the state. The majority of the remaining participants use Portland Harbor, but some boats remain in Port Clyde (Knox County), Cundy’s Harbor (Cumberland County), Saco and Kennebunk (York County). Dedicated shoreside infrastructure in these harbors including offloading facilities, vessel services, and transport companies has fallen on hard times. Although there is optimism that the resource base will rebound, in the short term many Maine boats are tied up or now berth in Massachusetts ports where there are slight operating advantages.

It is an incredibly complex task to study and calculate fish populations. Conducting these assessments in real time to allow for regulatory guidance is an even more challenging task and as a result cod and other multispecies assessments are incomplete and change yearly. According to preliminary results of a new National Oceanic and Atmospheric Administration stock assessment which is considered the “best science available”, Gulf of Maine cod populations have continued to drop despite decades of catch restrictions. It is estimated that the cod population is as little as 3-4% of the ideal population for a sustainable fishery to exist³⁷. Unfortunately this could result in further limitations placed on a fishermen’s ability to harvest other allocations, because they may have to stop fishing once the cod allocation has been harvested.

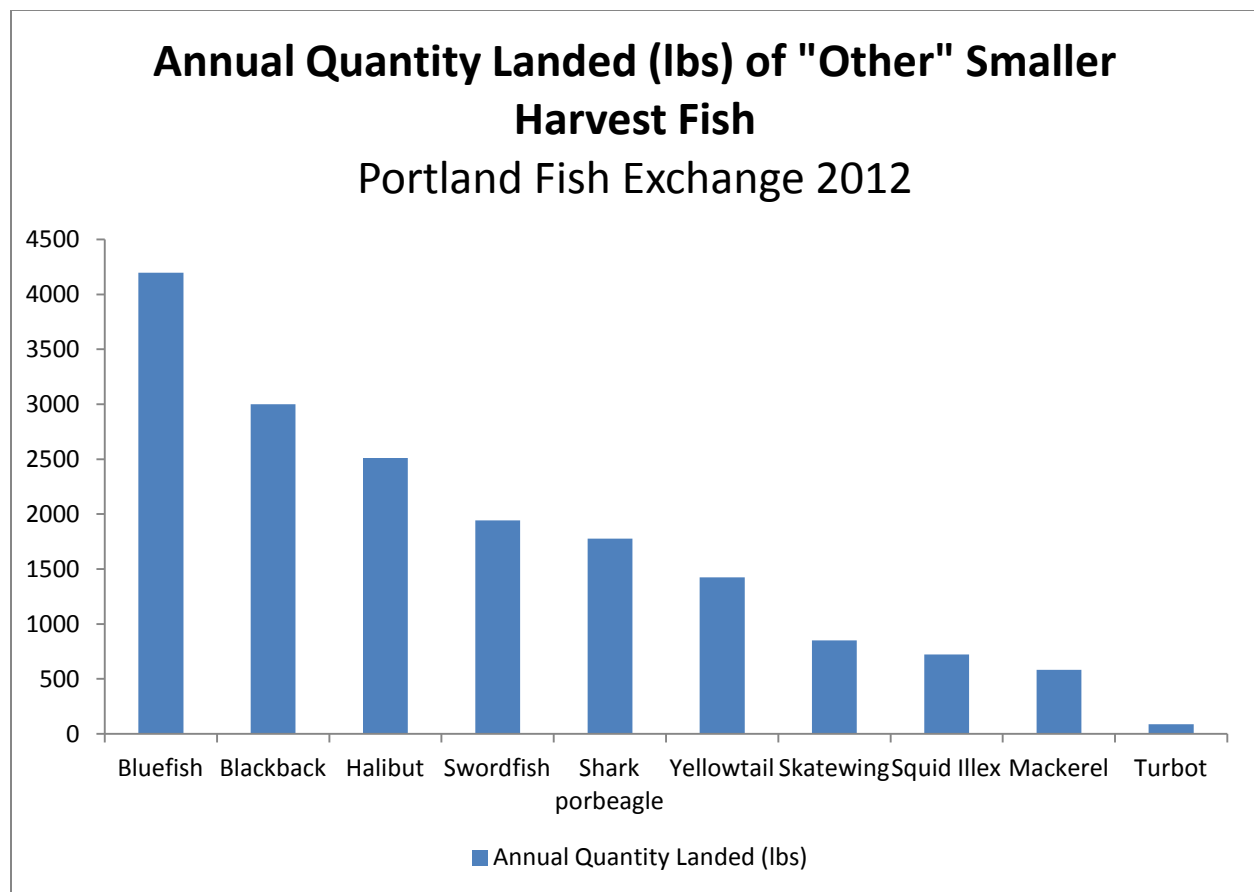
The Portland Fish Exchange

The majority of groundfish that is landed in Maine usually ends up at the Portland Fish Exchange whether it is landed by boat or trucked to the facility from another Maine harbor. The graph below shows the annual quantity of fish landed at the Exchange by species that are above 15,000 lbs. (cumulative for the year).



The graph below shows the annual quantity of fish landed at the Portland Fish Exchange by species that are below 15,000 lbs. (cumulative for the year).

³⁷ <http://www.pressherald.com/2014/08/06/tough-task-ahead-for-regulators-as-cod-numbers-drop-further-in-gulf-of-maine/>



History of the Portland Fish Exchange

The Portland Fish Exchange is America's first all-display fresh seafood auction that opened in 1986. The Exchange is a non-profit, quasi-public corporation managed by a Board of Directors representing seafood buyers and sellers, City residents and government leaders. The Exchange provides buyers and sellers with impartial grading and weighing services. The daily auctions help to determine the most accurate, fair and up-to-date prices for wholesale fresh seafood. Price information is transparent to seafood buyers and sellers to allow them to make the best possible market decisions. The Exchange acts as a financial intermediary, providing payments to sellers and collecting payments from buyers while taking a per pound fee for the service. Sellers receive payment for their catch within 24 hours of product sale at the Exchange. At the close of each auction buyers receive invoices for products and services received, with 14 day payment terms.³⁸ Before the Exchange was built the fresh fish markets in Portland were quite chaotic and unstable. It was everyone for themselves, let the buyer beware. Standard handling practices were not employed and it was incredibly inefficient. The Exchange brought fairness, stability and order to the fresh fish market.

The Portland Fish Exchange today

The Portland Fish Exchange remains an integral part of the Maine fresh fish market and is one of three fish auctions on the East coast (the other two are located in Massachusetts and include the Gloucester Seafood Display Auction, and the Whaling City Seafood Auction in New Bedford). In 2012, ~40 vessels landed directly at the Exchange and a number of other fishermen trucked their products to the Exchange for sale at the auction. At one time the Exchange was landing 30 million pounds of fish annually. In 2012, 5,523,729 lbs. of seafood passed

³⁸ <http://www.pfex.org/auction/>

through the Exchange which represents ~18% of the volume of the peak years. There are ~15 federally regulated species that are landed at the Exchange and ~10 other species that are sporadically landed. These include: Blackback, Bluefish, Cod, Cusk, Dab, Dogfish, Greysole, Haddock, Hake, Halibut, Herring, Mackerel, Monkfish, Pollock, Redfish, Scallops, Seaweed, Shark porbeagle, Shrimp, Skatewing, Squid Illex, Swordfish, Turbot, Whiting and Yellowtail. Groundfish is landed year round and other species arrive according to seasonality and regulations (herring, bluefish, halibut, Mackerel, scallops, shrimp, squid etc.). The Exchange caters to 'day-boats' during the summer which includes trawlers, gillnetters and hook vessels. Based on vessel size only the larger gill netters and trawlers fish year round.

Quality Control

In generally, ice is placed in each vessel's hold before they leave the dock and fish are added and iced as they are caught. It is up to the fishermen to handle the fish in a manner that will keep the fish in the best presentable manner possible. When Maine fish are landed, they are potentially competing with fish from all over the world. Dr. Ken La Valley at the New Hampshire Sea Grant Program has assembled some very helpful slides on fish handling practices that can be implemented both on vessels and onshore. The presentation is titled "Quality Control Measures: From Harvest through Point of Sale" and can be found online³⁹.

Handling of the fish

Ice is placed in each vessel's hold and fish are added and iced as they are caught. Fish arrive at the Exchange on ice in insulated Xactic containers between 34-40 degrees F. The ice is removed from the fish as they are offloaded from the vessel (or truck), fish are sorted, weighed, put into totes, tagged with a barcode and re-iced. Portland's only commercial ice manufacturer, Vessel Services Inc. is situated on the adjacent pier to the south. The Exchange buys ice which is pumped through a pipe slung below the pier decks. These businesses are interdependent. If one were to fail the other would be severely compromised. After re-icing, fish are then moved into a refrigerated cooler by pallet jack or forklift. Fish are displayed on the auction floor and are separated by species, size and vessel for buyers to inspect. Fish are auctioned off at 11:00 AM and most (if not all) of the product is out the door by 3:00-4:00 PM. Fish is allowed to be on site for 24 hours for no fee. Many buyers will consolidate their products at the Exchange and then load their trucks once they are ready to ship.

Prices paid at the Portland Fish Exchange

Groundfish prices fluctuate a lot with the season. Flatfish, pollock and hake tend to experience some of the more extreme highs and lows in prices. Gillnet boats (that fish everyday and make day trips) tend to hit high and low prices at the Portland Fish Exchange and this allows them to average out over time. Trawlers (that make multiple day trips) on the other hand may land their fish once a week and are often subject to greater price fluctuations over the course of a fishing season. If they land on a low price day, or on a higher priced day, it's the luck of the draw. All species experience fluctuating pricing based on 'supply & demand' factors. Fishermen will try to play/anticipate the market prices as best they can. Currently there is very little cash incentive to handle fish in a way that is above and beyond standard practices. There could be an opportunity to instill handling practices for uninterrupted cold, extra ice, and faster shipment to the consumer, but it would need to be done through a local buyer who is marketing the practice and "selling the story". One potential barrier to this is the regulated requirement that the first receiver is required to weigh the fish. This requires that all fish are removed from the iced totes and then re-iced/toted. This can compromise the quality of the fish because of the extra handling and exposure to a slightly different temperature that the fish encounters in the process. There are some companies in Maine who are doing this and it does require extra work. In general, fish that are landed at the Portland Fish Exchange are handled very well and

³⁹

<http://webcache.googleusercontent.com/search?q=cache:1xfasrKqHjg:extension.unh.edu/marine/documents/TTTableQualityControl.pptx+&cd=1&hl=en&ct=clnk&gl=us>

differentiation among fish caught on specific vessels can be difficult to project an added value. Having said that, the reputation of a specific vessel or fisherman can have implications for years to come if fish are handled in any way that is considered substandard. With the display auction, better quality fish will attract better pricing. Daily and weekly price reports are available (at no charge) on the Exchange's web site. There is also a historical price query tool available to compare prices and landings from 2003 to the present day.⁴⁰

Supply & Demand

New England groundfish landings declined 40% in 2013. The supply of fresh fish has become tighter and tighter yet the appetite for fresh fish in the market is still very high. This has created a need for more fish protein in various forms, e.g. aquaculture raised fish and frozen fish imported from other countries. These alternative sources of fish have subsequently lowered the prices of wild caught fresh fish. In order to process seafood in Maine profitably, we depend on other parts of the region to build/maintain markets for Maine's raw product. Some of Maine's processing facilities have become dependent on raw seafood product from other parts of the region. Inconsistencies in landings (volume) have hurt the markets because processors need a steady supply of product and if they can't find it in Maine, they will look for it elsewhere. (Pacific west coast, Alaska, Atlantic Canada, Iceland, Norway, China, Indonesia, Peru, Japan, Mexico and Chile). In the past, the quality of Maine seafood products had been a strong enough asset to hold their place in the market. On-boat processing (frozen at sea) has allowed foreign competitors to provide a high quality product with very little difference to what Maine vessels are able to land as fresh fish. The ability to process at sea and produce product that is of arguably higher quality that also allows producers to manage inventory (because they can store it) is dependent on higher volumes of allowable catch. Maine's catch limits are extremely low compared to the countries listed above. Fishermen have said that the lower volumes prevent them from doing more processing at sea because they wouldn't have the economy of scale to make it worth the investment. Having said that, there are fishermen from other parts of the world who have found a way to process at sea at very low volumes of product on very small vessels because they are tapping into higher value niche markets where the price return per pound makes it worth it. Approximately 90% of fish consumed in the US is now imported. The appetite for seafood continues to grow while at the same time the National Oceanic and Atmospheric Administration (NOAA) and the National Marine Fisheries Service (NMFS) restrict domestic fishing for fear of fishing the stocks beyond sustainable levels. A small portion is actually landed in the US, processed elsewhere and brought back for consumption. With lower fish landings we have also lost nearly all of the localized small fish cutting capacity (a workforce to fillet fish for a fee) as well as distribution to local restaurants. A lot of restaurants are now buying frozen fish because of the stability and predictability of supply and the prolonged shelf life. Fresh fish markets are eroding and the message to the public about what to buy is becoming increasingly challenging for Maine seafood consumers.

Assets of the Portland Fish Exchange

The Exchange serves as a convenient central point for trucks to access the Portland waterfront and its seafood resources. There is a large parking area where trucks can turn around easily and are close to interstate 95. Five bay doors on the loading dock allow access to the 22,000 square foot refrigerated warehouse. The Exchange provides two gas forklifts, four pallet jacks and a tote washer among other services that can be found on their website.⁴¹

Destinations of Maine groundfish

Ninety percent of the fish landed at the Exchange leaves the state of Maine (bound for Boston, New York City, upstate New York, Florida, Pennsylvania, the Midwest and overseas). The balance stays in Maine and is distributed to local buyers who fillet the fish for value added opportunities, local processing, and restaurants. Most restaurants are offering frozen fish rather than fresh fish, and the fresh fish they do offer may be a short term special they are

⁴⁰ <http://www.pfex.org/price-landing-tool/>

⁴¹ <http://www.pfex.org/services/>

running. Frozen fish is easier to store and have on hand as needed when compared to fresh fish that has a much shorter shelf life. There are a number of trucking companies that pick product up at the Exchange and move it to Boston, the larger players include: Fry Trucking, Galway Bay Transport, Hannaford, RC Moore and Wade. Refer to the table labeled “Distribution (Transport)” on the online resource for a more comprehensive list. The list is not likely 100% complete but it includes the information that is available for some of the larger transporters.

Buyers at the Portland Fish Exchange

Business Name	Processor	Wholesaler	Distributor	Retail Market
Ad-Jon	x			
Bristol Seafood, Inc	x	x		
Browne Trading Company, Inc		x		x
Channel Fish Processing Co.	x			
Cozy Harbor Seafood	x	x	x	
Douty Brothers, Inc.	x	x	x	
Smitty's Fillet House, Inc.	x		x	
Fresh Pack Seafood, Inc.			x	
Great Eastern Seafood, Inc.	x		x	
Harbor Fish Markets, Inc.		x	x	x
M.F. Foley, Inc.	x		x	
North Atlantic, Inc.	x		x	
Emerald Sea Food Company, Inc.				x
Nova Seafood, LTD.			x	
P.J. Merrill Seafood, Inc.	x		x	x
Red's Best			x	
Sea Fresh U.S.A. Inc.	x		x	
Sebasco Wharf			x	
Tri-State Seafoods, Inc.	x	x	x	

The Portland Fish Exchange provides local, fresh fish to buyers daily. It attracts a diverse range of businesses—including processors, wholesalers, distributors, retail markets, and one restaurant chain. There are 19 companies that buy from the Exchange on a regular basis. Twelve of them or about 63% are based in Maine. The remaining companies come from Massachusetts, New Hampshire, New York and Rhode Island. This results in a total of 7 out of state buyers, or about 37%. At 42%, the majority of the in state buyers are distributors. Five of the eight out of state buyers are processors, resulting in 26% of the total. To view an up to date list of buyers who frequent the daily auction of fish at the Exchange this information can be seen in the table above and found at the following link http://reports.pfex.org/buyers/buyer_list.htm

The Future of the Portland Fish Exchange

The Exchange is currently offering bait storage for lobstermen who want to stockpile bait in anticipation of a shortage. The Exchange has the capacity to store up to 450 pallets space of salted bait in 55 gallon drums (4 barrels to a pallet and stacked). Redfish bait for the lobster fishery is now being brought into Portland on container ships from Iceland. Lobster bait can also be loaded onto some of the larger lobster vessels that fish offshore. In recent

years the Exchange has rented surplus space to a Cozy Harbor and Calendar Islands/Dropping Springs. The exchange has the potential to handle under-utilized species such as dogfish, redfish and whiting. There have been attempts to allow Maine lobster to be landed at the Exchange as “bycatch” but these efforts have not prevailed due to significant opposition from the lobster industry. The Exchange has the space and capacity to offer more cross docking access for businesses to aggregate their seafood. Currently operating at about 50% capacity, they could handle up to 100k lbs. of seafood a day. It may be wise to further modify the Portland Fish Exchange so it operates on the volume of fish landed there today (5M lbs a year) rather than the historical 30M lbs a year.

Aquaculture in Maine

Aquaculture is the farming of fish, shellfish, and plants. Maine has access to more freshwater and saltwater than any other state east of the Mississippi which contributes to its achievement of being the top marine aquaculture producing state. Maine has been production limited and not market limited. The aquaculture industry has two distinct sectors; finfish and shellfish. The shellfish industry operates on a small scale while the finfish industry is larger. In 2004, the total value of the aquaculture industry was estimated at \$57 million⁴².

The Department of Marine Resources leases state owned waters to private parties for conducting aquaculture activities. Limited Purpose Aquaculture Licenses (LPAs) can also be issued. These are annual licenses issued for a maximum of 400 square feet. As of March 2014, there are 3 seaweed leases, 74 shellfish leases, 26 finfish leases and 148 LPAs. Finfish uses the largest amount of acreage at 665, next is shellfish at 608, seaweed at 6.92 and the LPAs use 1.48. In total, 1,281.4 acres are leased and used for aquaculture. The DMR does a good job of keeping the lease inventory up to date and quite a bit of information can be found on their website

<http://www.maine.gov/dmr/aquaculture/leaseinventory/index.htm>. If you are interested in requesting an up to date list of lease holders and the products they culture you can contact DMR Scientist Marcy Nelson at marcy.nelson@maine.gov (207) 633-9502.

The finfish sector is mostly centered in Cobscook and Machias Bay. Of the 26 finfish leases, 13 are located in Cobscook Bay, 6 in Machias Bay, 2 in Frenchman bay, 2 in Eastern Bay and 1 in Toothacher Bay⁴³. The different finfish species raised and harvested are salmon, rainbow trout and steelhead trout with farm raised salmon serving as the primary product. Salmon accounts for 95% of the total value of Maine aquaculture production. Although production is high in Maine, the salmon farms only supply less than 5% of the US market, and represent less than 1% of salmon produced worldwide. The finfish sector plans to expand, with experiments underway to raise cod, halibut, and haddock on fish farms⁴⁴.

Species raised and harvested in the shellfish sector are oysters, clams, mussels and scallops. Oysters make up the majority of the production and therefore the sector is concentrated in the Damariscotta River where the majority of the oyster production takes place. The remaining lease sites are mostly in the mid-coast area. 57 sites out of the 74 shellfish leases are identified⁴⁵. The Damariscotta River has the largest amount of leases at 19. Next is Penobscot Bay with 6 and then Casco Bay with 5. Seaweed leases are the only current leases representing the harvesting of sea vegetables in Maine. The three leases are located in Casco Bay. Many of the growers have established buyers that they deliver or direct ship their products to. Maine farm raised shellfish products are not found in every fish market so it can take a bit of looking around to find them. One way to purchase these products is by contacting the growers directly and a list of leaseholders can be requested from the DMR as mentioned above.

The Department of Marine Resources supports aquaculture research. It offers experimental leases which are smaller in size and shorter in duration compared to standard leases. The purpose of them is to allow for further research with shellfish or finfish on sites before a longer or larger lease is needed. There are currently 19 experimental leases

⁴² http://www.maine.gov/dmr/aquaculture/aqtaskforce/AQTF_FullReport2-13.pdf

⁴³ <http://www.maine.gov/dmr/aquaculture/leaseinventory/finfishleases.htm>

⁴⁴ http://www.maine.gov/dmr/aquaculture/aqtaskforce/AQTF_FullReport2-13.pdf

⁴⁵ <http://www.maine.gov/dmr/aquaculture/leaseinventory/shellfishleases.htm>

held on different sites throughout the coast. A list of the lease holders and their locations can be found on the Department of Marine Resources website⁴⁶. The website only provides area maps, not one map of all the different lease sites⁴⁷.

Cultured Sea Vegetables

Maine is the first state in the country to host a company that is raising sea vegetables (kelp) in open water farms. Ocean Approved, LLC was founded by Tollef Olson in 2006 and the business was named to follow their philosophy of only utilizing practices that the ocean would approve of. Located in Portland, ME they currently have four open water kelp farms in Maine. Three sites in Casco Bay and one site in the Blue Hill Salt Pond in Blue Hill, ME. Kelp thrives in low light, thus it is planted from October-December and harvested by Olson and his partner Paul Dobbins in March. Their farming practices are environmentally friendly. Kelp relies on photosynthesis to generate energy and it helps filter the coastal waters by absorbing nitrogen, phosphorus, and carbon dioxide, which are three nutrients we have too much of in our waters⁴⁸. The kelp is processed immediately after it is harvested. This prevents it from drying out so that the flavor remains mild and sweeter with a preferred texture and vibrant green color⁴⁹. Ocean approved currently sells 9 products on a wholesale level and is working to sell their products on a retail level. They have also partnered with various corporations and their products are served at Mercy Hospital, Gould Academy, Portland Public Schools, Bowdoin College, the University of Maine, the University of New Hampshire and Dartmouth College. The innovative work of Ocean Approved is receiving international attention. In the past, they have had visitors from Japan, Korea, Sweden, Norway, and Canada observe and inquire about their kelp operations. Paul has also reached out internationally by traveling to Ireland twice to assist a lobsterman interested in producing kelp. Ocean Approved sets an example of a thriving, successful business that also practices sustainability.

Alternative (non-traditional) Markets for Maine Seafood Products

Fish markets, grocery stores, lobster pounds and roadside peddlers are some of the more common and traditional ways to purchase Maine seafood products. Population growth, technology and innovative thinkers have brought about some ways to get seafood into the hands of consumers. With an ever changing business model that sometimes must sell many fish at a low price or adapt to selling fewer fish at a higher price there are bumps along the road. Below are a few examples where innovative marketing is being used to support direct sales from producers/processors to retailers and consumers in an attempt to shorten the supply chain. A shorter supply chain also helps to establish a documented chain of custody into distribution. Localize processing with a mission attached to it is an increasingly popular model to gain higher profits.

Gulf of Maine Research Institute (GMRI) Since 2011 GMRI has been working on an initiative called the “Gulf of Maine Responsibly Harvested” brand to help identify seafood products that are harvested from the waters of the Gulf of Maine region (Nova Scotia to Cape Cod). By working with local harvesters and processors, they are able to support jobs and shoreside infrastructure that keep the seafood supply chain in our region’s ports. It is also a means to provide traceability information as seafood makes its way up the supply chain and informs consumers that their fishery is managed in a way that contributes to the long-term health of the resource. Suppliers of Gulf of Maine Responsibly Harvested product also commit to continuously improving the sustainability of the seafood industry. Local Maine partners include the following processors/dealers: Bristol, Cozy Harbor and North Atlantic, Inc. Local retail partners who carry the brand include Hannaford & Shaw’s supermarkets.

<http://www.gmri.org/our-work/sustainable-seafood/responsibly-harvested-brand>

⁴⁶ <http://www.maine.gov/dmr/aquaculture/leaseinventory/experimental.htm>

⁴⁷ <http://www.maine.gov/dmr/aquaculture/leaseinventory/index.htm>

⁴⁸ <http://www.oceanapproved.com/kelp-the-earth/>

⁴⁹ <http://uniquemainefarms.com/uniquemainefarms.com/Ocean.html>

Maine Coast Community Sector represents 45 different groundfish permits, 33 individual businesses and consists of 17 boats fishing under the sector. Port Clyde is the last remaining port east of Portland with a small fleet of boats that still fish for groundfish. ~10% of the Port Clyde fishermen's catch (specifically) is sold to local consumers through their marketing brand of "Port Clyde Fresh Catch" which is a for-profit S Corporation. This avenue for their landings accounts for only about 1-2% of the entire Maine Coast Community Sector catch. The remaining fish are trucked and sold through the Portland Fish Exchange.

Port Clyde Fresh Catch is the first community-supported fishery in the nation. It is located in Port Clyde, Maine and was originated by Glen Libby, a local fisherman who came up with the idea after being inspired by the agricultural sector and hearing a talk from a farmer about what the community does for him. About a dozen other struggling fishermen who wanted to save their fish stock and careers joined Libby to form the fishery. Their fishery is sustainable in its practices, for example, they use nets which allow more young fish to escape and they fish a range of species, instead of focusing on receiving a high volume of only one type. They process all of the fish and shellfish that they catch themselves and they only work with cooks who agree to buy whatever fish local fishermen catch. 100% of their seafood is from the Gulf of Maine and all of it is processed at their site in Port Clyde.
<http://www.portclydefreshcatch.com/>

Eat Local Fish is a family operated business located in Portland, ME that delivers fresh, local fish to its customers. The company is run by Allyson Jordan who owns two ground fish trawlers which operate out of Portland. She is the representative of the sale of fish at the Portland Fish Exchange and also in Gloucester, MA. She is committed to serving her customers local, fresh fish which she catches in the Gulf of Maine. Through a list serve, Facebook, email and her website consumers can see when her vessels are planning to fish, up to date fish offerings and a variety of shipping, local delivery and/or local pick up options. <http://eatlocalfish.com/>

Salt and Sea LLC is another family owned business that is committed to serving its consumers fresh, local fish. They have multiple boats based in Portland and offer the sale of a variety of fish and shellfish that they catch in the Gulf of Maine. In order to receive their products, you must become a member. Members purchase and receive weekly shares that consist of different types of fish and shellfish. They are able to enjoy local, fresh seafood and support sustainable fishing. <http://saltandsea.me/>

Maine Dayboat Scallops is a business run by Togue Brawn in an effort to source high quality scallops from Maine boats making one day fishing trips. Togue meets the boats at the dock and efficiently ship's overnight or via ground service. She guarantee's the scallops were harvested within 24 hours of shipping or 48 hours of in-person delivery. Her efforts are focused on yielding a better price for the fishermen and putting a superior product on the market in a nontraditional way (outside of the normal seafood distribution system). <http://www.mainedayboatscallops.com/>

Maine Farmers Markets

Farmers markets are known for offering local and sustainably grown food. The USDA's definition is as follows, "A farmers' market is defined as a multi-stall market at which farmer-producers sell agricultural products directly to the general public at a central or fixed location, particularly fresh fruit and vegetables (but also meat products, dairy products, and/or grains)".⁵⁰ The presence of seafood at Maine Farmers Markets is gaining in popularity. Maine fishermen are allowed to sell their catch to customers themselves (direct). Some lobstermen are finding that they can charge ~\$1.50 more per pound by selling at an inland market away from the coast. There are the added costs of transporting lobsters (fuel) and spending time at the market to sell their product. The Maine Federation of Farmers Markets has an article on their website that specifies the permits that are required for selling at a Farmers Market. Fish- Any processed fish has to be processed in a commercial facility licensed as a commercial food processor. Requires a "mobile vendor's license"⁵¹ to sell at a farmers' market. Lobstermen are the only fishermen that are

⁵⁰ <http://www.fns.usda.gov/eat/what-farmers-market>

⁵¹ http://www.maine.gov/dacf/qar/permits_and_licenses/application_forms.shtml

allowed to sell their product without any other licensing (besides the mobile vendor license mentioned above.) It has to be the lobsterman's own product (caught on their boat,) and the lobsterman has to be the one selling it. For any other seafood, the seller has to have a “wholesaler's license” from the Department of Marine Resources.⁵² This includes if a lobsterman wants to sell any other fish other than his own lobsters.⁵³ As far as finfish is concerned there are some further limitations for tapping into farmers markets. The fishermen must sell the fish whole. If a fisherman has landing a few thousand pounds of fish, it can be hard to justify the time and effort to sell ~100 lbs. at a farmers market when they could take their fish directly to the Portland Fish Exchange and sell it all at once. There have been some challenging situations at a few Maine markets involving non-compete clauses and who can sell at that particular market and what they can sell. Most farmers markets don't have a policy plan in place to accommodate seafood so it can create more questions than answers when trying to enter a market. Clarity to this conversation could potentially help bring more Maine seafood to markets.

Maine Federation of Farmers Markets

There are ~140 Maine Farmers markets and ~10% of them have seafood offerings. The Maine Federation of Farmers Markets maintains a website <http://www.maine farmersmarkets.org/> that provides a complete list of farmers markets in the state. Under the Farmers' market tab on the top of the page, there is a section titled “About Farmers' markets.” Selecting this tab will then show six links and the second one, Maine Farmers' Market Websites, provides access to each individual farmers market. Each website has a complete list of vendors and it is there that the offering of seafood can be found. 13 of the markets listed offer seafood (Bath, Belfast, Boothbay, Brunswick, Camden, Cumberland, Damariscotta, Gardiner, Lewiston, Orono, Saco, Stonington, and (York) Gateway). Each market has their own supply of fish and receives it from various locations. For example, the market in Bath gets their seafood and lobster from the Pemaquid Peninsula while the vendor who is selling seafood at the Brunswick farmer's market gets their seafood from Casco Bay. Each market has different vendors and each vendor can be found on the individual markets website. Some of the seafood precuts offered include: lobster, clams, mussels, crabs, crab meat, seafood cakes, soups, chowders and baked fish.

Good Shepherd Food Bank

The Good Shepherd Food Bank (GSFB) is a food bank committed to providing those in need in all sixteen counties in Maine with adequate food supplies. It has three main distribution centers located in Auburn, Biddeford, and Brewer and the administrative office is located in Portland. The food bank receives millions of pounds of food each year through its connections with Maine's food industry- whether it is from a large food manufacturer or a local farmer donating excess produce. It receives additional truckloads of food from Feeding America, the nation's leading domestic hunger-relief charity.

The obtained food is used to serve more than 600 food pantries, soup kitchens and community programs throughout the state of Maine. The food bank works with additional partner agencies to provide food to their clients. These agencies include food pantries, homeless shelters, safe havens, rehab facilities, after school feeding programs, soup kitchens, group homes, and nutrition sites for children and the elderly. It is estimated that more than 100,000 people are fed through their partner agencies each month. Their website provides a map which lists all 297 food pantries that they have connections with in Maine. To make it easier, you are able to search the map using your zip code in order to quickly find the closest food pantry to your location. The map can be found by following this link: <http://www.gsfb.org/help/food-map/>

GSFB is involved in a program called “Mainers Feeding Mainers” where they have developed partnerships with Maine farmers, dairy operators and fishing industries in order to provide fresh, local food to their clients. This enables them to serve as a resource to provide residents in Maine with easy access to seafood that is caught in Maine. It further promotes the integration of Maine seafood into the local food system. Two seafood processors that have worked with GSFB include: Cozy Harbor and Nova Seafood providing pollock, cod, haddock and

⁵² <http://www.maine.gov/dmr/license/fees.htm>

⁵³ <http://www.maine farmersmarkets.org/farmers-markets/keeping-your-market-legal/permits-required-for-selling-at-farmers-market/>

shrimp. GSFB would like to offer more Maine seafood products to those in need and when seafood is available to the pantries it goes very quickly. There is a misconception that all food that passes through GSFB is donated. In fact GSFB does have a budget and can actively purchase specific food products they wish to make available to their consumers. GSFB offers great potential as a conduit for providing seafood to more Maine consumers through their existing trucking (the largest transport network in state), logistics software and building infrastructure.

Food Hubs in New England

During the summer of 2014, CEI conducted a follow up study (to this report) to better understand the challenges and opportunities New England based “food hubs” have when considering offering seafood. The USDA defines a food hub as, “a centrally located facility with a business management structure facilitating the aggregation, storage, processing, distribution, and/or marketing of locally/regionally produced food products.” Thirty six food hubs all of which are based in New England were contacted to participate in the study. New England states best serve the purpose of integrating Maine seafood due to their proximity to Maine which best aligns with the definition of ‘local’ and encompasses the large metropolitan city of Boston which is heavily utilized in northern New England for most distribution networks of seafood. Our plan is to help educate New England food hub buyers about what is available for fish and community fisheries networks in Maine as an avenue to create greater demand. This may also help to better integrate fisheries products and agricultural products in a combined regional distribution system. By developing new domestic markets we will create more demand and be less reliant on imported fisheries.

Seafood Supply Chain Diagram

One of the better Seafood Supply Chain Diagram’s we have seen in recent times was created by Manta Consulting Inc. in 2013 for a competition called FISH 2.0. It illustrates a typical avenue that seafood travels in a way that is not overly complicated. <http://www.fish20.org/images/Fish20TheSupplyChain.pdf>

Summary of Findings

Strategies to focus on processed and frozen products

- Many companies in Maine are adding value to our marine resources and making them available to consumers worldwide although the availability of these products is not always widely known.
- Consumers are looking for quick easy to prepare meals and there is a huge selection of value added and/or frozen seafood offerings to be had.
- There are a number of businesses in Maine that are capable of storing fresh fish for short term and frozen fish products for long term capacity.
- There is a need to look for more value added and processing opportunities for the species of fish that are in high demand and sustainably fished.
- In May of 2014, the Greater Portland area received a designation under the “Investing in Manufacturing Communities Partnership” initiative which offers priority consideration for \$1.3 billion in Federal grants from 11 Federal agencies to help implement a vision called the “Greater Portland Sustainable Food Production Cluster”. This is an opportunity to create a manufacturing (processing) hub around agriculture and seafood products.

In light of the above bullet points, we have assembled an online resource housed on CEI’s website for food buyers who are interested in sourcing Maine seafood and various value added seafood products. We anticipate that food buyers (restaurants, wholesalers, food hubs and other food system businesses) can learn about the availability of raw and processed seafood products and then contact businesses directly about the current availability of products and prices.

Transportation strategies

- For moving seafood out of the state of Maine, Portland is central to the transportation and distribution of Maine seafood. The majority of the seafood leaving the state is making its way to Boston. From there, connections are made with two major trucking distributors Araho Transfer and Peninsula Of Boston Inc. as well as connections with commercial airline carriers.
- For moving seafood in and around Maine the Good Shepard Food Bank offers great potential as a conduit for providing seafood to more Maine consumers through their existing trucking (the largest transport network in state) their logistics software and building infrastructure.
- Packaged seafood originating from many locations in coastal Maine may be shipped through FedEx and UPS using the least expensive ground delivery service. Most destinations within the New England states and parts of downstate eastern New York are designated for one day Ground Service delivery if the origination location is located within Maine's southern or central coastal areas.
- The development of Maine-based processing facilities for lobster and advanced transport systems for live lobster will diversify the market for lobster and increase demand blunting the full impact of lowered lobster prices and rising fuel and bait costs.
- Eimskip is now offering container transport of seafood products throughout the North Atlantic. This has created an incredible opportunity for Maine to export value added seafood products to Newfoundland, Iceland, Norway, Faroe Island, Scotland and mainland Europe.
- With the planned expansion of the International Marine Terminal Facility in Portland, this creates more opportunities with both rail and container transport of seafood products to other regions of the country & world.

In light of the above bullet points, we have assembled an online resource housed on CEI's website for food buyers to see companies that pick-up, transport and deliver seafood products. The routes that they travel and the products that they carry are shown in order to accommodate potential buyers, sellers, and others who are interested in obtaining Maine seafood.

Importance of the Portland Fish Exchange

- New England groundfish landings declined 40% in 2013.
- Approximately 90% of fish consumed in the US is now coming from overseas.
- With or without lobster landings included, the city of Portland is the central hub for the Maine seafood industry. The Portland Fish Exchange and Vessel Services (ice making capacity) remain an integral part of Maine's seafood industry.
- The majority of groundfish that is landed in Maine usually ends up at the Portland Fish Exchange whether it is landed by boat or trucked to the facility from another Maine harbor.
- The facility is easily accessible to Maine's transportation systems including: roads (I-95, I-295), the Portland International Jetport, the International Marine Terminal Facility and future rail service.
- The Exchange has the space and capacity to offer more cross docking access for businesses to aggregate their seafood. With 22,000 square feet of refrigerated warehouse space there are times when there is very little product on site (~5M lbs. a year now, down from 30M lbs. in its heyday).

Buyers who hold accounts at the Portland Fish Exchange and are eligible to bid and purchase fish from the Exchange are listed in the online resource for food buyers to contact if they wish to source Maine groundfish from a buyer.

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(*) Peer reviewer.

Assessing New England Food Hubs Appetite for Maine Seafood

Introduction

During the summer of 2014, CEI conducted a study to understand the challenges and opportunities New England based “food hubs” have when considering offering seafood. The USDA defines a food hub as, “a centrally located facility with a business management structure facilitating the aggregation, storage, processing, distribution, and/or marketing of locally/regionally produced food products.” 36 food hubs all of which are based in New England were contacted to participate in a survey. This specific region was the focal point of the research as a follow up to a study conducted by CEI titled “Maine Seafood Study: A look at the integration of Maine seafood into food distribution systems.” Maine is suited well to serve the purpose of integrating seafood into New England Food Hubs due to the diverse offerings of fresh seafood and the geographic proximity of the state in relation to the large metropolitan city of Boston which is heavily utilized in northern New England for most distribution networks of seafood.

Methodology

As of 01/15/14, 301 food hubs were identified nationwide by the United States Department of Agriculture (USDA). The list is updated regularly and can be found in PDF file format on the USDA’s website.⁵⁴ The list was reviewed to select food hubs that are located in the New England region-encompassing the states of Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and Connecticut. 36 food hubs (according to the list at the time of the study) are located in New England. The USDA list includes websites for each food hub and we viewed each website in order to determine whether or not seafood is currently being offered. This was also determined by contacting the food hub managers directly if websites were unclear.

CEI staff developed a questionnaire for the survey. Prior to circulating the questionnaire it was observed that 12 of the 36 identified food hubs in New England were already offering seafood at varying levels and the 24 were not. As a result, two slightly different versions of the questionnaire were produced in order to capture the best responses of the food hubs (currently offering seafood) and those (not currently offering seafood). Each questionnaire contained the same 13 questions, but the wording was changed slightly for the food hubs that currently offer seafood. After obtaining the email addresses for the food hub managers, they were each sent an e-mail describing the Maine seafood study with a questionnaire attached. We asked the food hub managers if a phone conversation could be set up with the assurance that any information shared would be incorporated and presented in aggregate form and that individual responses and business names would not be revealed. For those food hubs which did not reply to the initial e-mail inquiry, they were contacted by telephone.

Ultimately, 18 of the 36 (50%) food hubs participated in the study and provided responses to the questionnaires. This includes 12 food hubs that don’t currently offer seafood and 6 that currently do offer seafood. Data was gathered to identify trends, challenges and barriers that the food hubs anticipate or have already experienced in regards to offering seafood. During the phone interviews comments were encouraged to better understand the responses provided to the given questions and were sorted to identify commonalities. Individual notes were taken while interviewing the managers of each food hub on the telephone and the answers to the questions from the survey were inserted into an Excel file. This allowed for commonalities and trends to be easily identified. Percentages were then calculated in order to effectively present the data in aggregate form. Most of the responses were grouped collectively, but some responses were separated between food hubs that offer seafood and food hubs that do not.

Results

⁵⁴ <http://www.ams.usda.gov/AMSv1.0/getfile?dDocName=STELPRDC5091437>

Do you currently offer seafood?

The respondents were asked if they currently offer seafood.

67% responded “No”

33% responded “Yes”

Based on the interviews held with the managers of the food hubs that do not currently offer seafood, it was found that their reasons for not offering seafood vary.

- 33% stated that they only aggregate vegetables and do not foresee the expansion of product offerings in the future.
- 25% stated that they have offered seafood in the past but have stopped due to complications such as price point issues and lack of freezer storage.
- 25% indicated that their location and definition of “local” would hamper their interest in sourcing Maine seafood.

The food hubs that do offer seafood vary in breadth and depth of products and types.

- 50% of them offer frozen seafood only
- 33% offer a wide variety of seafood products which includes both fresh and frozen
- 17% offer a small variety which includes fresh fish only.

Current Assets

When asked what assets their facility currently has, the most common response (out of 18 participants) was refrigerated storage (56%), followed by refrigerated transport (44%) and freezer storage (44%). Three businesses (16%) indicated that they have some form of processing capacity. Only two respondents (11%) indicated that they had ice making capacity. One business (5%) has packing capacity. One business (5%) has frozen transport capacity. A third of the respondents (33%) stated that they do not have any of the assets that were listed on the questionnaire (listed below).

Refrigerated storage (56%)

Refrigerated transport (44%)

Freezer storage (44%)

Processing (filleting, dry, salt, smoke, freeze dry) (16%)

Ice making (11%)

Packing (vacuum pack, insulated containers) (5%)

Freezer transport (5%)

None of the above (33%)

Level of interest in offering seafood?

Those food hubs which currently offer seafood were asked if they are interested in expanding their offerings.

- 66% “Yes” interested in offering more
- 34% responded “maybe”

In terms of not being certain as to whether or not they want to increase their offerings, ‘additional infrastructure investments’ and ‘sustainability and quality of the seafood’ were reasons given for the hesitation.

The food hubs were split in regards to expressing an interest in offering seafood on a scale of 1-5, 5 being the most interested and 1 being the least.

- 50% rated their level of interest as “somewhat or very interested” (rated a 4 or 5)
- 33% responded that they have “no interest” (rated a 1)
- 8% responded “maybe” (rated a 3)
- 8% responded “probably not interested” (rated a 2)

Necessary assets

Comments from the respondents showed that many do not offer seafood because they lack the necessary infrastructure.

- 75% stated that they would need freezer storage
- 50% stated that they would need to invest in refrigerated storage

The food hubs that currently offer seafood shared their insight on what is required in order to provide seafood to consumers. One food hub responded that it needed to purchase an ice making machine and a dedicated display case in its retail store. 100% already had refrigerated and freezer storage and refrigerated transport.

Transportation

Transportation of products is necessary for either aggregation at food hub facilities or distribution to markets. It was found that most of the food hubs currently only aggregate vegetables and either have a retail storefront or offer a delivery service, in which many use their own vehicles.

Out of the 12 food hubs that do not offer seafood:

- 25% currently have refrigerated transport
- 75% identified this as a barrier to allow the integration of seafood products into their systems

Out of the 6 food hubs that currently offer seafood:

- 83% have refrigerated transport
- 33% have freezer transport.

From this, 80% own their own trucks and 20% utilize a transportation company.

Workforce needs

Food hubs that do not offer seafood stated

- 33% anticipate additional workforce needs
- 17% would need a truck driver
- 17% would need to hire other employees to handle orders

Food hubs that offer seafood

(17%) hire additional employees in order to allow for the integration of seafood products.

Demand

The respondents were asked if they have customers asking for seafood and to rate this level from 1-5, with 1 being never and 5 being all the time.

- 28% strong demand for seafood “all the time” (rated a 4 or 5)
- 33% stated that they “sometimes” have customers asking for seafood (rated a 3)
- 39% little or no demand (rated a 1 or 2)

Wish List

The respondents were asked what seafood products they would like to offer and were given a list of five categories of fresh, frozen, live, shellfish and sea vegetables.

- 56% would like to offer frozen products
- 50% shellfish
- 44% fresh
- 44% sea vegetables
- 17% live

- 17% all of them except live
- 17% all of the choices
- 22% responded that they would not like to offer any of the given seafood products.

Maine seafood

When the 18 food hubs were asked if they would be interested in offering Maine seafood.

- 56% no interest
- 39% yes interested
- 17% of the food hubs that already offer seafood currently sourced from Maine.

Additional findings beyond the scope of the questionnaire

What does local mean?

It was of great interest to discover that the definition of “local food” differs depending on the individual responding, business location and/or proximity to Maine. 22% of the food hubs that indicated they were not interested in offering Maine seafood stated that the reason behind this is because “they only distribute and sell local goods and they do not consider products from Maine to be local”.

- 50% consider local to be within their state
- 25% consider local to be within their county
- 25% define local as produce that is sourced within 100 miles of their location

A study conducted by the Maine Food Strategy in 2013 surveyed 600 households in Maine to determine how Mainers understand the state’s food system. One of the questions on the Food Strategy survey asked its respondents what “local food” meant to them. The options included “in town, county, Maine and New England.”

- 61% responded “Maine”
- 19% responded “County”
- 9% responded “New England”
- 6% responded “town.”⁵⁵

Comparison to food hubs across the nation

In 2013, the Michigan State University Center for Regional Food Systems partnered with the Wallace Center at Winrock International to conduct a national survey of food hubs. The survey investigated food hubs’ financial viability, economic impact, healthy food access, challenges faced, and emerging market opportunities. The survey had 107 participants. The report highlighted the top six challenges that the majority of the food hubs identified when given a list of potential operational challenges.

The top six were:

- Managing growth
- Balancing supply and demand
- Access to capital
- Finding appropriate technology to manage operations
- Negotiating prices with producers and customers
- Finding reliable seasonal and/or part time staff⁵⁶

⁵⁵ <http://mainefoodstrategy.com/wp-content/uploads/2014/05/maine-food-strategys-consumer-survey-report.pdf>

⁵⁶ <http://foodsystems.msu.edu/uploads/files/2013-food-hub-survey.pdf>

The 18 food hubs that participated in the CEI study in New England were also asked about challenges and barriers that they experienced or anticipate to experience with implementing seafood co-distribution with agricultural products. This question was posed in a discussion format and a list of potential challenges was not provided.

- 32% do not currently have the assets to handle seafood (refrigeration, freezer, storage, trucks, transportation)
- 22% Maine seafood is not a local option to source
- 18% Only aggregate vegetables, not interested in seafood
- 9% Finding reliable seasonal and/or part time staff
- 9% Identified access to capital
- 5% Quality concerns
- 5% Lack knowledge of seafood industry

50% of the food hubs that currently offer seafood stated that they experienced challenges when they started to implement seafood into their distribution systems.

Challenges included:

- hiring additional employees
- purchasing additional assets
- negotiating prices with producers and customers

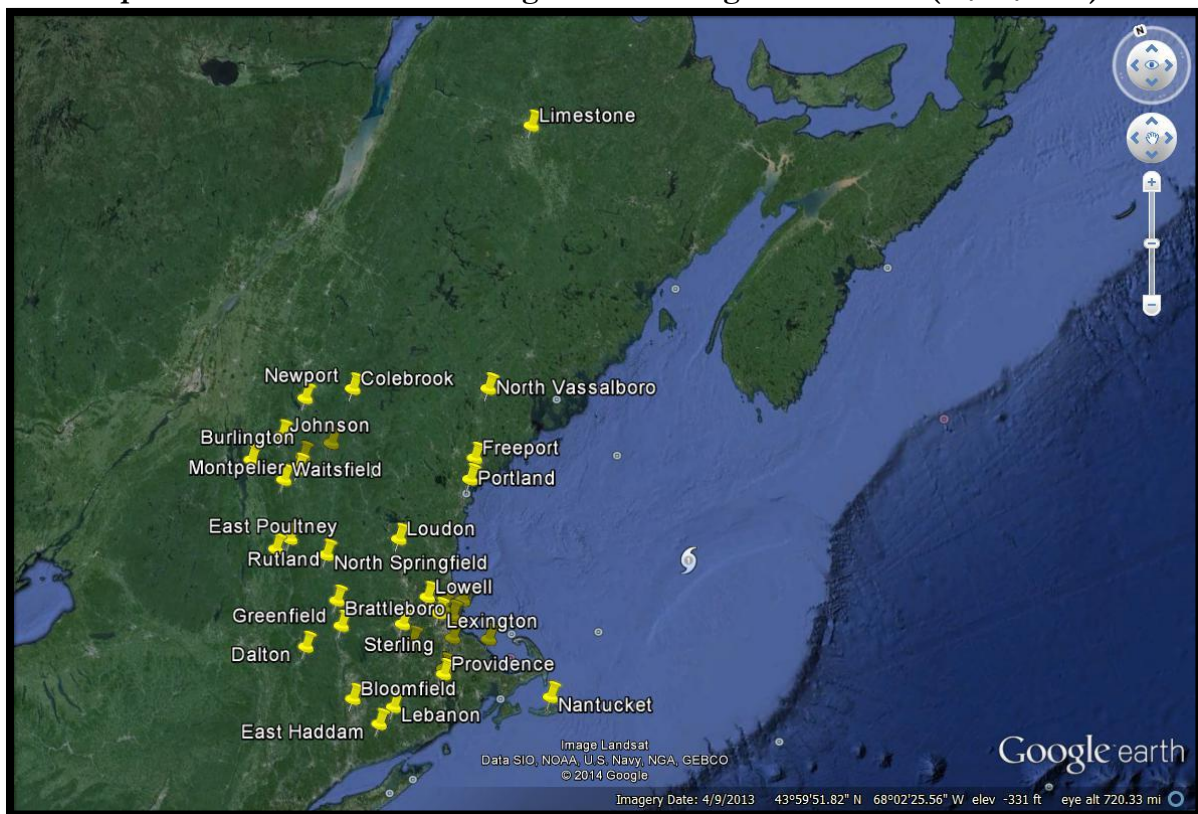
Appendices

Appendix I---Map of the food hubs in New England according to the USDA (01/15/2014)

Appendix II---Questionnaire for food hubs that currently offer seafood

Appendix III---Questionnaire for food hubs that do not currently offer seafood

Appendix I---Map of the food hubs in New England according to the USDA (01/15/2014)



Appendix II---Questionnaire for food hubs that currently offer seafood

Business name: _____

Name of individual responding to questions: _____

1. Do you currently offer seafood? (yes/no)
 - a. If yes, what types of seafood do you offer? (Species and product type, e.g. Haddock 3 oz. fillet frozen)
2. What assets does your facility currently have that enable you to offer seafood?
 - Refrigerated storage
 - Freezer storage
 - Ice making
 - Processing (filleting, dry, salt, smoke, freeze dry)
 - Packing (vacuum pack, insulated containers)
 - Refrigerated transport
 - Freezer transport
 - Recirculating seawater (lobster or fish tank)
 - Other...?
3. If you currently process and pack products (seafood or agricultural), what type of equipment do you use?
4. If you currently offer seafood, (on a scale of 1-5) what is your level of interest in offering more seafood options?
 - 1-no interest
 - 2-probably not interested
 - 3-maybe
 - 4-somewhat interested
 - 5-very interested
5. What assets did you need to invest in to enable you to offer seafood (what necessary infrastructure)?
6. What workforce needs (jobs) did you anticipate/create to allow for expansion (adding seafood products)?
7. What barriers/challenges do you see with implementing seafood co-distribution with Agricultural products?
8. Regarding transportation of products for either aggregation to your facility or distribution to markets, do you have your own trucks or do you utilize a transportation company?
9. Do your distribution routes utilize pick up or drop off locations in or near Boston?
10. Do you have customers asking for seafood?
 - 1-never
 - 2-rarely
 - 3-sometimes
 - 4-regularly

5-all the time

11. What seafood products would you like to offer (your wish list)?

Fresh

Frozen

Live

Shellfish

Sea vegetables

12. Where do you currently source your seafood from?

13. Would you be interested in offering Maine seafood?

1-no interest

2-probably not interested

3-maybe

4-somewhat interested

5-very interested

Appendix III---Questionnaire for food hubs that do not currently offer seafood

Business name: _____

Name of individual responding to questions: _____

1. Do you currently offer seafood? (yes/no)

a. If yes, what types of seafood do you offer? (Species and product type, e.g. Haddock 3 oz. fillet frozen)

2. What assets does your facility currently have that could enable you to offer seafood?

Refrigerated storage

Freezer storage

Ice making

Processing (filleting, dry, salt, smoke, freeze dry)

Packing (vacuum pack, insulated containers)

Refrigerated transport

Freezer transport

Recirculating seawater (lobster or fish tank)

Other...?

3. If you currently process and pack products (seafood or agricultural), what type of equipment do you use?

4. If you do not currently offer seafood, (on a scale of 1-5) what is your level of interest in offering seafood?

1-no interest

2-probably not interested

3-maybe

4-somewhat interested

5-very interested

5. What assets would you need to invest in to enable you to offer seafood (what necessary infrastructure)?
6. What workforce needs (jobs) would you anticipate/create to allow for expansion (adding seafood products)?
7. What barriers/challenges do you see with implementing seafood co-distribution with Agricultural products?
8. Regarding transportation of products for either aggregation to your facility or distribution to markets, do you have your own trucks or do you utilize a transportation company?
9. Do your distribution routes utilize pick up or drop off locations in or near Boston?
10. Do you have customers asking for seafood?
 - 1-never
 - 2-rarely
 - 3-sometimes
 - 4-regularly
 - 5-all the time
11. What seafood products would you like to offer (your wish list)?
 - Fresh
 - Frozen
 - Live
 - Shellfish
 - Sea vegetables
12. Where would you source your seafood from?
13. Would you be interested in offering Maine seafood?
 - 1-no interest
 - 2-probably not interested
 - 3-maybe
 - 4-somewhat interested
 - 5-very interested